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AGENDA ITEM 3:   AVIATION SAFETY

REGIONAL DATA COLLECTION, ANALYSIS AND INFORMATION SHARING FOR AVIATION SAFETY IN ASIA PACIFIC (AP-SHARE)

Presented by China, Indonesia, Japan, the Philippines, Singapore, Thailand, Association of

Asia Pacific Airlines, International Air Transport Association, Airbus, Boeing, Flight Safety

Foundation and The MITRE Corporation

SUMMARY

This paper highlights the progress of the AP-SHARE Demonstration Project for data collection, analysis and information sharing for aviation safety in the Asia Pacific region since its commencement in September 2017. The project objectives are to integrate and analyse operational data from various sources in support of safety awareness and improvements.

The AP-SHARE is progressing towards the successful demonstration of data-driven analysis to address a particular safety issue in support of safety risk management. This is made possible through the establishment of a robust governance framework and the active collaboration among all participating States/Administrations and industry partners.

**REGIONAL DATA COLLECTION, ANALYSIS AND INFORMATION SHARING FOR
AVIATION SAFETY IN ASIA PACIFIC (AP-SHARE)**

1.   INTRODUCTION

1.1   The exchange of safety information at the regional level enables the validation of existing safety risks, detection of emerging safety issues and facilitates effective and timely action. ICAO's Global Aviation Safety Plan (GASP) identifies safety information sharing as a safety performance enabler that is required to achieve the objectives of this Plan. As an indication of the importance of safety data usage and its impact on the State Safety Program, ICAO Annex 19 emphasises safety data collection, analysis and exchange to support States'/Administrations' safety management activities.

1.2   Recognising the benefits of sharing and exchange of safety information on a regional basis, the 38th ICAO General Assembly agreed that the Regional Aviation Safety Groups (RASGs) should be encouraged to develop and implement regional safety data sharing and analysis programmes and systems. The 2nd ICAO High Level Safety Conference in 2015 also called for further development of global safety initiatives and implementation strategies to be built on the collection, analysis and sharing of information among States/Administrations and aviation stakeholders, with appropriate tools, systems and legal frameworks to enable States/Administrations and organisations to use the shared safety information.

1.3   The AP-SHARE is a regional data sharing initiative involving Asia Pacific States/Administrations and industry partners, in collaboration with Flight Safety Foundation (FSF) and MITRE as Secretariat. The AP-SHARE currently has 5 member States, namely China, Indonesia, Japan, the Philippines and Singapore and 15 industry partners (Association of Asia Pacific Airlines, International Air Transport Association, All Nippon Airways, Batik Air, Citilink Indonesia, Garuda Indonesia, Indonesia AirAsia, Japan Airlines, Lion Air, Scoot-Tigerair, SilkAir, Singapore Airlines, Sriwijaya Air, Airbus and Boeing). As members, they are bound by the governing principles, including those of safety management and information protection, as spelt out in the AP-SHARE Governance Plan. The project is funded by States/Administrations through an annual contribution for the 3-year duration of the Project. A Governing Board (GB), supported by a Technical Working Group (TWG), presides over the activities of AP-SHARE. Both the TWG and GB are led by State and industry co-chairs.

2.   PROGRESS TO DATE

2.1   The options for an Asia Pacific regional data sharing programme were first discussed at the 3rd meeting of the Asia Pacific Regional Aviation Safety Team (APRAST/3) meeting in May 2013. APRAST subsequently supported Singapore's proposal to engage FSF and MITRE to perform a study on the feasibility of a regional data sharing programme. In August 2014, FSF/MITRE completed the feasibility study which affirmed the benefits of having such a programme, and recommended that a Demonstration Project be conducted to show the benefits of a regional data sharing programme. This initiative was also endorsed by RASG-APAC.

2.2   Between 2014 and 2017, the Flight Safety Foundation (FSF) and MITRE in collaboration with Asia Pacific States/Administrations, ANSPs, and industry stakeholders, had facilitated a series of workshops and meetings to develop the project guiding principles and overall governance to initiate a Demonstration Project of a regional data collection, analysis and information sharing for aviation safety (AP-SHARE). In particular, a Governance Plan (contained in Annex A) has been established to clearly define the roles and responsibilities of all participants, the governing structure comprising a Governing Board, working groups and the Secretariat, and the working processes including the scope of analysis, and confidentiality provisions for all information shared and discussed. By signing a Statement of Intent (at Appendix B of the Governance Plan) to participate in the AP-SHARE, members agree to abide by a set of core principles guiding this project. This Governance Plan is an essential and living document to guide the work of the AP-SHARE.

2.3   The AP-SHARE Demonstration Project was launched in September 2017 with the inaugural meetings of the GB and the TWG. The 3-year Demonstration Project seeks to address issues of concern such as data protection and confidentiality, operating models, and governance structure. A key element will be to foster confidence and build trust among all participants in a collaborative approach to use data to support safety advancement goals.

2.4   One of the foremost tasks was to identify the priority safety issues. Based on the sharing from the members, the top three topics identified were: (i) Traffic Collision Avoidance System-Resolution Advisory (TCAS-RA)/Loss of Separation/Mid Air Collision Risk; (ii) Runway Excursion/Energy Management/Unstable Approach; and (iii) Weather Related Deviations/Severe Turbulence.

3.   CONDUCT OF THE DEMONSTRATION PROJECT

3.1   AP-SHARE is expected to complete a study of one safety issue per year using a four-step methodology - Identification, Characterisation, Validation and Mitigation. In the first safety issue, AP-SHARE studied TCAS-RA events as a precursor of mid-air collision.

3.2   The initial steps of data collection and preliminary analysis to understand common scenarios of TCAS-RA events have been completed. This forms the "Characterisation" phase in the study of a safety issue in the AP-SHARE. The study revealed several common scenarios where TCAS-RA events are triggered in member States'/Administrations' airspaces.

3.3   After these common scenarios were understood, the next step was to use additional data as "Validation" of the earlier characterisation. More data were gathered from member States/Administrations and industry partners to describe the scenarios along with the approximate locations and details of the circumstances that may have contributed these scenarios. One key observation was that a significant number of TCAS-RA events were triggered although the aircraft involved had followed the required ATC clearances and/or adhered to operating procedures. In addition, through the process, the study could describe not only what happened but also the contributing factors to the TCAS-RA events. These details have been used to formulate potential mitigations. AP-SHARE plans to review the applicability and effectiveness of the potential mitigations, before member States/Administrations implement the mitigations. This study is expected to be completed by end-2018.

3.4   The conduct of the first safety study has provided an excellent opportunity to test the governance of the regional programme while promoting active collaboration among all participating organisations to draw important regional insights into a safety issue. These insights gained from AP-SHARE are likely to have applications beyond the participating organisations.

3.5   A signed statement of intent from the Governance Plan is required prior to joining this Demonstration Project. It is critical for States/Administrations interested in contributing their knowledge or information sources to join this effort in the coming months, before the commencement of the study on the second safety topic in early 2019. The next AP-SHARE GB meeting, which is open to observer States/Administrations and industry stakeholders, will be held on 8 November 2018 and hosted by the DGCA Indonesia

4.   ACTION BY THE CONFERENCE

4.1   The Conference is invited to:

a)   Note the progress of the AP-SHARE as a pioneering initiative in the Asia Pacific region to establish a regional data sharing mechanism in support of safety risk management;

b)   Note the governance, cost-sharing and safety analysis modalities of the AP-SHARE; and

c)   Encourage States/Administrations, together with their local industry partners, and industry stakeholders to participate in the second year of the Demonstration Project through the submission of the Statement of Intent to FSF/MITRE as soon as possible.

— END —

Governance Plan for the Demonstration Project of Asia Pacific Regional Data Collection, Analysis and Information Sharing for Aviation Safety

April 2018

Version 7

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1.0   Background and Initiation of the Demonstration Project

The exchange of safety information is recognized as a fundamental element of long-term improvements in the safety of civil aviation. The International Civil Aviation Organization (ICAO) Global Aviation Safety Plan and Annex 19 emphasize the importance of exchanging safety information*. Efforts to share aviation safety information in the United States and Pan America have been valuable in identifying safety issues and supporting effective and timely action to address safety risks.

Since 2013, the Asia Pacific Regional Aviation Safety Team (APRAST) has supported efforts to understand the potential for safety data collection, analysis, and information sharing in the Asia Pacific (APAC) region. The Flight Safety Foundation (FSF) and The MITRE Corporation (MITRE) conducted a feasibility study that was completed in August 2014. The study indicated a general consensus that regional data collection, analysis and information sharing would enhance aviation safety and strengthen the ability of State Authorities and service providers to identify safety hazards and develop targeted safety improvements. The feasibility study also identified challenges associated with the implementation of a safety information sharing system in APAC.

In view of the positive outcome of the feasibility study, APRAST and the Regional Aviation Safety Group-APAC (RASG-APAC) supported a plan to conduct a three-year Demonstration Project of Asia Pacific Regional Data Collection, Analysis and Information Sharing for Aviation Safety. The intent of this project is to demonstrate the benefits of such a capability and to address issues such as data protection and confidentiality, operating models, and governance structure. A key element of the Demonstration Project will be to build trust among all participating organizations to show that sensitive safety information can be used to support safety goals without jeopardizing data providers.

In December 2014, FSF and MITRE hosted a workshop of APAC States and Administrations, Air Navigation Service Providers (ANSPs), airlines and industry organizations in Singapore to discuss the next steps in developing a collaboration environment that would be needed for a Demonstration Project. The workshop resulted in a set of core principles and basic elements of data analysis and information sharing that should be part of the Demonstration Project. Another workshop held in Tokyo, Japan in December 2016 resulted in refinements to these concepts.

This Governance Plan builds on the feasibility study and workshops to provide more details regarding the Demonstration Project. It describes core principles, roles and responsibilities of members, and protections that will be applied to all safety information, both input data and information derived from data. This Governance Plan also describes the types of analysis that will be conducted and the processes for reviewing, distributing, and leveraging results.

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*Throughout this document, **safety data** refers to discrete or irreducible elements such as numerical values, generally collected by service providers on safety hazards. **Safety information** refers to the results of transforming safety data of discrete elements through analysis, assessment and control of the safety hazards.

The duration of the Demonstration Project is expected to be three years. It can be terminated or extended by consensus agreement of the member organizations.

2.0   Core Principles for the Demonstration Project

A set of core principles has been developed for the Demonstration Project at workshops in December 2014 in Singapore and December 2016 in Tokyo, Japan. The core principles follow.

- Safety information is used to advance safety goals only, with the focus on systemic issues.

- Safety information from the Demonstration Project will not be used to support investigations of accidents and will not be used for punitive or enforcement purposes.

- Demonstration Project members will be bound by the principles of safety management and data protection in ICAO Annex 19 in relation to the use of safety information.

- Roles, responsibilities and accountabilities are clearly defined.

- Processes for data handling and analysis are carried out with transparency and in accordance with this Governance Plan.

- The governance process is determined by consensus and is clear to all members.

- Confidentiality of sensitive information is maintained at all times.

These core principles are reflected throughout this Governance Plan.

3.0   Participation in the Demonstration Project

Participation in the Demonstration Project is strongly encouraged and open to all government and private sector aviation safety organizations that are involved in Asia Pacific commercial aviation operations and that can collaborate with the Secretariat without any international sanctions. An organization can become a full member of the Demonstration Project as described in Section 3.1, or it can interact with the Demonstration Project as a non-member subject matter expert by making contributions to specific activities. Non-members may also be invited by the Governing Board to observe up to two Governing Board meetings. Observers are not allowed to participate in Working Groups due to the sensitivity of the information shared.

Section 3.1 also describes how an organization can withdraw from being a member in the Demonstration Project. Sections 3.2 through 3.8 outline the responsibilities of members.

3.1   Entering and Withdrawing from the Demonstration Project

Before the Demonstration Project is initiated, an organization becomes a Demonstration Project member by signing the Statement of Intent in Appendix B of this Governance Plan. After the initiation of the Demonstration Project, the entry of an organization as a member is subject to approval by the Governing Board (Section 4.1), which will evaluate the applicant on the basis of their potential to contribute to the Demonstration Project.

A member organization can withdraw from the Demonstration Project at any time and for any reason by providing a minimum of 60 calendar days of notice to the Secretariat, so as to minimize any impact to the Demonstration Project.

The Governing Board may suspend or terminate membership or other participation in the Demonstration Project if it finds that an organization has violated the requirements described in this Governance Plan.

3.2 Responsibilities for All Members

All members agree to:

- Adhere to the core principles of the Demonstration Project (Section 2.0) and other elements of this Governance Plan.

- Provide subject matter experts, including pilots, controllers, manufacturers, or regulators with deep knowledge of aviation, to support Demonstration Project studies.

- Maintain the confidentiality of results until the Governing Board makes a determination about the form and distribution of results.

In addition, all members agree to:

- Attend meetings of the Governing Board (Section 4.1) to make decisions about priorities and governance.

3.3 Responsibilities Specific to Member States and Administrations

Member States and Administrations provide the following support in addition to the general responsibilities of Section 3.2:

- Provide insight about local regulatory context that may be helpful in a study or analysis.

- Ensure that safety information from the Demonstration Project is not used for enforcement investigations or actions.

- Follow the guidance in Appendix 5 to Chapter 4 of ICAO Doc 9859 in relation to the protection of safety information associated with the Demonstration Project.

- Provide other safety information that might be relevant to a study or analysis, such as accident or incident reports.

3.4 Responsibilities Specific to ANSPs

In addition to the responsibilities listed in Section 3.2, ANSPs provide summary safety metrics based on data sources and event definitions that will be developed in collaboration with the Secretariat (see Section 4.2). It is anticipated that different ANSPs will have different levels of infrastructure to support the measurement of safety events from air traffic data. The focus of ANSP participation is to develop the capability to generate meaningful metrics that can be integrated with other sources of safety information in the Demonstration Project.

Over the course of the Demonstration Project, the ANSPs works with the Secretariat to build a capability to:

- Locally extract, archive and process information from radar data, air traffic control information, weather, and other relevant sources.

- Apply Demonstration Project definitions to generate analytical results in the agreed upon format.

3.5   Responsibilities Specific to Airlines

Airlines contribute to the Demonstration Project by providing digital flight data and/or pilot safety reports to the International Air Transport Association (IATA) Flight Data Exchange (FDX) and Safety Trend Evaluation Analysis and Data Exchange System (STEADES) programs (through established IATA processes for FDX and STEADES including standard contractual processes). As described in Section 3.6, IATA processes the airline data and provides aggregated, de-identified analytical results to the Secretariat for integration with other information. IATA has offered to process airline data through their FDX and STEADES Programs regardless of whether an airline is a member of IATA.

If an airline does not participate in FDX and STEADES, it shall contribute to the Demonstration Project by providing flight data or safety reports through other means. Other proposed methods of providing processed flight data will be evaluated on a case-by-case basis. The Governing Board shall make a determination on the suitability of the proposed mode of information sharing to be included in the Demonstration Project.

Airlines who wish to be members in the Demonstration Project must sign the Statement of Intent in Appendix B and fulfill all responsibilities described in Section 3.2 above.

Airlines may also provide any data that would be beneficial to an ongoing study directly to the Secretariat for inclusion in Demonstration Project. Any data provided will be protected in accordance with all other sensitive data or safety information provided for the Demonstration Project.

3.6   Responsibilities Specific to IATA

IATA will make analytical results available for use by the Demonstration Project by providing them to the Secretariat for integration with other information. This activity will be conducted as per a memorandum of understanding (MOU) between IATA and the Secretariat and is dependent on compliance with the conditions of the MOU by signatories to the MOU.

IATA will assess and, at its discretion, adopt the definitions and formats suggested by the Demonstration Project Secretariat (Section 4.2) based on input from relevant Working Groups (Section 4.3) to facilitate integrated analysis across all sources of safety information.

3.7   Responsibilities Specific to AAPA

AAPA will interact with its member airlines and accept input from other airlines in the region to develop coordinated input to Demonstration Project initiatives and studies.

3.8   Responsibilities of Other Organizations

The common responsibilities listed in Section 3.2 apply to all other member organizations. Other organizations that provide information and insight that may be helpful in safety studies or analysis under the Demonstration Project may become members of the Demonstration Project,

subject to approval from the Governing Board. Such organizations include Boeing, Airbus, International Federation of Air Line Pilots' Associations (IFALPA), Civil Air Navigation Services Organisation (CANSO). Any member organization may also provide data to the Secretariat under a separate agreement, as appropriate, for inclusion in Demonstration Project analyses.

4.0   Governance Structure for the Demonstration Project

The Demonstration Project will be directed by a Governing Board formed by and consisting of the members of the Demonstration Project. The Governing Board is supported by the Secretariat. The Governing Board will form Working Groups as needed. The Governing Board will collaborate with RASG-APAC, APRAST, and other regional bodies to carry out its safety mission.

4.1   Governing Board

Member organizations in the Demonstration Project provide representatives to the Governing Board, which sets strategic direction and monitors progress. The Governing Board meets twice yearly to re-evaluate strategy and priorities and to receive updates on the progress of data integration and analysis. The Governing Board will be led by State and industry co-chairs. All decisions by the Governing Board are achieved through the process of achieving consensus. The Governing Board's primary responsibilities are to:

- Oversee the activities of the Demonstration Project to ensure conformance with the Governance Plan.

- Prioritize studies.

- Define the scope for new studies and oversee Working Group progress.

- Review the results of Demonstration Project studies and determine appropriate follow-up actions, if any.

- Make changes, as needed, to this Governance Plan.

- Review requests for membership after the initiation of the Demonstration Project.

- Formulate policies and procedures.

- Make decisions about dissemination of results to external organizations.

- Select the Secretariat and approve all entities on the Secretariat.

- Oversee technical and financial performance of the Secretariat.

- Provide coordination between the Demonstration Project and APRAST on regional risks and mitigation needs.

- Conduct a review and make a report to the Regional Aviation Safety Group–Asia Pacific / APRAST at the end of the Demonstration Project.

4.2   Secretariat

The Secretariat for the Demonstration Project is responsible for coordinating studies in alignment with the priorities set by the Governing Board. A key function of the Secretariat is to

harmonize inputs from multiple information sources and organizations to enable integrated analysis. The Secretariat is also responsible for managing the data assets and capabilities under its control and for conducting analysis. In addition, the Secretariat manages the administrative and project management functions of the Demonstration Project.

The Secretariat's primary responsibilities are to:

- Provide detailed definitions for analytical results that will be generated by member organizations for inclusion in integrated analysis.

- Develop and maintain an efficient, cost effective and secure information technology architecture for storing, integrating, analyzing, protecting, and sharing any safety information that is managed by the Secretariat.

- Acquire data and safety information and develop analytical tools for analyzing, visualizing, and sharing results.

- Support Working Groups to execute studies at the direction of the Governing Board. Integrate inputs across various organizations and safety information sources in support of Working Groups.

- Implement Governing Board decisions on sharing results of studies.

- Conduct all analysis and information sharing activities in accordance with this Governance Plan.

- Update and maintain this Governance Plan, as directed by the Governing Board.

- Maintain a list of members and subject matter experts in the Demonstration Project.

- Maintain annual budget and report to the Governing Board on financial and technical status.

4.3   Working Groups

The Governing Board establishes Working Groups as needed to conduct studies. Working Group participants can be from Demonstration Project member organizations or subject matter experts from non-member organizations. Working Groups will be led by State and industry co-chairs.

Working Groups have the following responsibilities:

- Work with the Governing Board to determine the scope of the analysis, the sources of data and safety information, the analytical approach and tools, and the form of the result.

- Conduct analysis with the support of the Secretariat.

- Interpret the results of analysis.

- Submit results to the Governing Board.

5.0   Data and Information for Demonstration Project Analysis

The data and safety information needed for the Demonstration Project analyses will be provided by IATA, AAPA, airlines, ANSPs, and other sources. Each source is unique in terms of content, format, storage, and processing, as described in the following subsections.

All data and information provided to the Demonstration Project, regardless of its origin or prior processing, will be stored and accessed using secure information technology capabilities provided by the Secretariat.

5.1   ANSP Data and Information

As described in Section 3.4, ANSPs will work with the Secretariat to develop a capability to provide analytical results based on data, metrics definitions and results formats that align with the capability of the ANSP and the needs of the Demonstration Project. ANSP processing will draw on data sources that are typically available to ANSPs, such as radar tracks, airspace and airport configurations, and weather. The Secretariat will integrate ANSP analytical results with other sources of information.

5.2   Airline Data and Information

Two principal types of airline data used in the Demonstration Project are flight data monitoring (FDM) information and airline safety reports.

FDM information is used to generate quantitative analytical results according to the definitions and format provided by the Secretariat based on input from affected Working Groups. Typically, FDM data will be acquired, accessed, and stored according to airline agreements with IATA as part of the airline's participation in IATA's FDX program.

Airline text-based safety reports are used to better characterize safety events and their contributing factors. Airline agreements with IATA under STEADES will be leveraged so that IATA can provide aggregated input to the Demonstration Project, also in alignment with input from Working Groups. Though STEADES accepts safety events in many languages, English or English-translation reports are preferred.

IATA will process airline FDM and safety report data as per the IATA processes and protocols and make aggregate and de-identified information available in a format agreed upon jointly by the Secretariat and IATA to the Secretariat for integration.

Information derived from IATA programs shall not be shared, copied, or otherwise be made available without agreement by the Governing Board.

Airlines could provide other data through other member organizations or directly to the Secretariat. Any data provided will be protected in accordance with all other sensitive data or safety information provided for the Demonstration Project.

5.3 Other Data

As directed by the Governing Board, other data sources may be acquired by the Secretariat to supplement ANSP and airline information. The Secretariat will integrate all relevant information from various sources in support of Demonstration Project studies. Protection and use of these other data sources will be in accordance with Section 7.1 of this plan.

6.0   Scope and Types of Analysis

Analysis is restricted to the boundaries of the participating member States, including the airspace under their control. Analysis will be conducted for all member States.

Analyses conducted under the Demonstration Project include, but are not restricted to, the following types of studies. As this document is an enabling governance plan of possible activities, it does not constitute a detailed implementation plan for the Demonstration Project. During the demonstration period, it is expected that a subset of these analyses are undertaken, recognizing that an incremental approach and a realistic scope will improve the chances of success of the Demonstration Project. The Governing Board will approve annual plans based on a number of factors, including emerging risks, resources, availability of appropriate data, and maturity level of capabilities. As described in Section 4.1, the Governing Board will also approve the scope of the analysis. It is expected that the initial analysis will be focused within the region represented by the member States and Administrations.

- Known Risk Monitoring
- Directed Studies
- Vulnerability Discovery
- Benchmarks

6.1   Known Risk Monitoring

Known Risk Monitoring metrics are developed and assessed to track identified risks, detect emerging risks, and track the effectiveness of developed safety mitigations. The Secretariat generates these metrics, leveraging analytical results from ANSPs and IATA along with other sources of safety information.

6.2   Directed Studies

Detailed analyses of specific safety issues of interest to the Demonstration Project members, referred to as Directed Studies, can be authorized by the Governing Board. These Directed Studies leverage Demonstration Project safety information and resources to develop an in-depth understanding of a safety issue to provide support for effective mitigations.

6.3   Vulnerability Discovery

Vulnerability discovery analysis is conducted to identify and assess previously unknown or unrecognized issues or accident precursors. Demonstration Project vulnerability discovery activities include analysis of new problems, known problems appearing in new places or increasing in frequency or severity, new pathways or precursors to known problems, and new methods to measure and track known problems.

6.4   Benchmarks

Benchmarks are metrics prepared for an individual organization to compare its performance against aggregate performance of similar organizations. Benchmarks are recognized as a valuable tool for an organization to identify risks and prioritize local mitigation activities.

The Demonstration Project may provide benchmarks for individual data providers when there is adequate safety information to support the analysis using statistically proven methods.

7.0   Information Sharing Protocols

There are two key types of controls applied to Demonstration Project results: (1) processes to remove identifying information from data and results and (2) processes for sharing the aggregated results with member organizations and non-member organizations.

ANSP data will be maintained locally by each ANSP. Airline flight data and safety reports will be maintained by IATA at a location determined by IATA. The Secretariat intends to establish the necessary servers and analysis platform for integrating aggregate, de-identified results from ANSPs and IATA with other data sources at a location to be selected by the Governing Board. Data security measures for handling input data, preliminary results, and final results are described in Appendix A.

7.1   Removing Identifying Information

Data used for the Demonstration Project are maintained in a secure environment that prevents any party other than the Secretariat from accessing sensitive information. Data fields referring to individual employees are removed before storing information for the Demonstration Project. Data that includes flight-identifying information can be stored and used in the Demonstration Project in the secure environment.

Demonstration Project results are always aggregated and de-identified before sharing them with the Governing Board or distributing them to Demonstration Project members and non-member organizations. The details of de-identification will be developed as part of the Demonstration Project, but they will ensure at a minimum that no individual employee, airline or flight is identified in results. Any reports of individual flight information will remove references to flight identification number, aircraft tail number, and day of month. Any reports of aggregate results will only include airports that are served by 3 or more airlines in the data set. Additional details of de-identification of results can be found in Appendix A.2.

Additional de-identification are applied before sharing results with the Governing Board, including the removal of location-specific information. Working Groups have access to location-specific information when it is critical to the validation of the safety events and understanding of safety issues.

7.2   Sharing Demonstration Project Results

In accordance with Governing Board responsibilities (Section 4.1), policies for sharing of Demonstration Project results with members and non-member organizations will be established by the Governing Board. The Secretariat will distribute results to members and non-member organizations in accordance with Governing Board policy.

The Governing Board will coordinate Demonstration Project results with APRAST for regional risks and mitigation needs. Other coordination of results, if any, must be authorized by the Governing Board beforehand.

8.0   Cost Sharing Plan

In order to execute the Demonstration Project, there are some necessary activities and work elements that will incur costs. Since there is no single entity that is able to underwrite the entire Demonstration Project, the December 2014 Workshop established that these costs would be shared across the Demonstration Project members.

Table 8-1 describes the primary cost drivers for the Demonstration Project. These have been identified based on experience with similar programs elsewhere around the globe.

Table 8-1. Demonstration Project Cost Element Descriptions

Element	Description
Safety metrics development and sustainment	Known-Risk Monitoring is a set of analyses continuously performed to scan available safety information to track known safety risks. The Governing Board will determine the set of Known-Risk Monitoring analyses to be continuously tracked. These approved metrics will identify trends of known risk areas. The findings will be reported to the Governing Board at regular intervals or upon discovery of potential safety issues.
FDM and Safety Report results integration	Metrics definitions will be provided to safety information providers and de-identified information in a format agreed upon jointly by the Secretariat and the provider will be returned. The Secretariat will integrate the results with other environmental and contextual data to identify normal and non-normal performance by location, type of operation, and other relevant conditions.
ANSP and other surveillance results integration	Metrics definitions will be provided to each ANSP and de-identified information in a format determined by the Secretariat will be returned. These results will be integrated with other environmental and contextual data to identify normal and non-normal performance by location, type of operation, and other relevant conditions.
Safety dashboard development and risk investigations	Visualization is a key component of understanding and reporting out the results of the Demonstration Project. Visualization capabilities, including density plots, interactive charting capabilities and multi-data source visualization will support risk tracking as well as new risk detection. Commercial Off-The-Shelf (COTS) visualization capabilities will be tailored, if required, for the presentation of safety information and analytical results. Identified risk will be investigated and reported to the affected Working Group and/or the Governing Board.

Element	Description
Infrastructure development and sustainment	Ensure flexibility, efficiency, and security leading to the implementation of a data infrastructure that provides standards-based, distributed, secure, and efficient mechanisms to allow analysts the ability to access the information they need in the forms that they need it. The architecture will include an infrastructure of hardware, networking and software components both at a central location and at stakeholders' locations supporting both central and distributed data sources, advanced data management processes, and a range of analytic tools for monitoring, trending and visualizing safety information. The architecture will be developed to enable stakeholders to provide data in a secured and de-identified manner while maintaining support for Demonstration Project related analysis efforts.

Assimilate and utilize aviation information from many different sources, stored at many different locations, and subject to many different usage and governance constraints. Each information source also presents a unique set of data quality issues, data model standards and configuration management requirements. In addition, information from different sources must be rationalized to ensure that a data element from one source represents the same underlying entity as a data element from another source. |
| **Integration analysis and program management** | The ability to measure and monitor relationships that exist across multiple information sources providing a holistic picture of risk is a primary objective of the Demonstration Project analytic capabilities. The Secretariat will utilize information integration capabilities that include techniques that combine information from multiple sources in order to develop inferences, which will be more efficient and potentially more accurate than if they were achieved through the assessment of a single information source. The Secretariat will integrate the results from diverse information sources, highlight the potential risk areas detected, work across Working Groups and the Governance Board and manage the Demonstration Project processes to ensure appropriate results are addressed. |

Given the likelihood that State and Administration participation rates will vary over time, Table 8-2 provides estimates of work program scope and cost at multiple participation levels. Each column reflects scope estimates for a given participation range. The cost reflected in the last row gives a range driven by the participation rate. Nominally for each column, the lower the participation rate, the higher the unit cost for States. The Governing Board will make adjustments to the cost to States as additional States join the Demonstration Project.

**Table 8-2. Demonstration Project Cost Sharing Strategy
(Indicative, Subject to Governing Board Decisions)**

Item	Demonstration Project
Number of Member States	Up to 8
Governing Board Meetings	Semi Annual Face-to-Face
Number of Safety Topics	1
Number of In-Depth Studies	0
Number of ANSPs Providing Data	0
Web Portal for Results Sharing	No
Number of Working Group Meetings	Four Times per Year, Twice by Web Meeting
Number of Times Safety Results are Generated	Each Working Group Meeting
Cost per State per Year	US$50,000 (6 or fewer States) to US$40,000 (7-8 States)

Additional contributions to the Demonstration Project will take a variety of forms. In-kind support from operators, ANSPs, trade organizations and manufacturers will be critical to the operation of individual working groups.

It should be noted that infrastructure cost is not included in the cost sharing formula. The Secretariat will maintain the necessary information archives and perform data processing as needed within existing corporate infrastructure..

9.0 Changes to the Demonstration Project Governance Plan

Revisions to this Demonstration Project Governance Plan can be made with the consensus agreement of the Demonstration Project Governing Board. Changes will be documented in revisions to this Demonstration Project Governance Plan by the Secretariat.

Appendix A: Data Confidentiality Processes

All information used in the Demonstration Project will be managed according to the terms of this Governance Plan. In addition, information provided under terms of use agreements with IATA or the Secretariat will be handled in accordance with the additional provisions of those agreements. Figure A-1 provides an overview of the various processes that will be applied to both input data, derived information, and results to maintain confidentiality.

Stage of Process	Data Intake	Initial Analysis	Integration	Preliminary Results	Final Results
Responsible Parties	ANSP / IATA / AAPA / Secretariat	ANSP / IATA / AAPA / Secretariat	Secretariat	Working Group / Secretariat	Participants / Governing Board
Primary Activity Related to Data and Results	• Collect data and transform into standard format	• Generate analytical results using specified definitions and algorithms	• Integrate aggregate analytical results from various sources • Generate preliminary metrics or results	• Review integrated preliminary results • Request additional analysis, as needed	• Determine if final results satisfy the requirements of the metric or study
Data Confidentiality Processes	• Remove or encrypt identifying information as specified in agreements • Store and access data as specified in agreements	• Aggregate results in the specified format	• Apply automated processes to de-identify flights and airlines	• Review final results to ensure adequate level of de-identification	• Review final results to ensure adequate level of de-identification • Determine level of distribution to organizations not participating in the Demonstration Project

Provide information security protections to safeguard data and results
- Control access through authorization, passwords, and periodic reviews
- Develop and apply processes and controls for routine activities
- Automatically detect, alert, and prevent intrusions

Figure A-1. Data Confidentiality Processes for the Demonstration Project

A.1   Data Intake: Flight De-Identification

Any data that is transferred to the Demonstration Project for use in analysis will be processed to remove references to individuals, including air traffic controllers, pilots, dispatchers, and all other personnel. Additional de-identification of input data will be applied as specified in applicable data use agreements. Information provided by ANSPs will remove flight specific information, including flight identification number, aircraft tail number, and day of month. Additional ANSP de-identification will be in accordance with individual agreements.

The location for storing Demonstration Project data will vary, depending on the type of data and the applicable data use agreements with IATA, AAPA, or the Secretariat. All data and other safety information provided to the Secretariat will be stored and processed at a location to be proposed by the Secretariat and approved by the Governing Board. A key factor in selecting the

storage location will be the data protections provided by the State in which the safety information resides.

The Secretariat will provide standard protections for all information provided to or collected by the Secretariat. Protections span each stage of processing, analysis, and distribution of results, including:

- Controlling Secretariat personnel access through authorization, passwords, and periodic reviews of the list of people with access.

- Developing and applying processes and controls for routine activities, such as handling requests for access to information or ensuring destruction of data if required by data use agreements.

- Automatically preventing, detecting, and alerting intrusions through physical and logical segregation of networks and data, firewalls, intrusion detection and reporting systems, vulnerability scanning, and penetration testing.

A.2   Initial Analysis, Integration and Review of Results: Airline De-identification

As indicated in Figure A-1, the organization that handles data intake and storage also conducts initial analysis to generate aggregate results for integration. The Secretariat is responsible for integrating the various sources of aggregate results and interacting with the Working Groups to refine the analysis and presentation of results. At the completion of the Working Group activities, the Secretariat applies an additional level of protection to ensure that it is not possible to infer an individual flight or airline from the results. This situation could arise if there is only a single airline flying to an airport or represented in an aircraft group in the aggregate results. In cases where there are not three or more airlines represented (three or more airlines in the case of IATA analysis of FDM data), the presentation of results will be modified to prevent inadvertent identification of the airline.

The Secretariat has the responsibility for developing automated processes to ensure that two or more airlines are represented in final aggregate results. In addition, Working Groups that are established to guide activities for a specific metric or analysis will review the final results to ensure that they are adequately de-identified before forwarding the results to the Governing Board. The Governing Board will review the final results as a cross check to ensure that an individual airline is not inadvertently identified by the analysis.

A.3   Distribution of Results

Once the Governing Board has approved final study results, it will make a determination about the form and distribution of the results to Demonstration Project members and to non-member organizations.

Appendix B: Statements of Intent to Become a Member

Statement of Intent for States and Administrations to Become a Member of the Demonstration Project of Asia Pacific Regional Data Collection, Analysis and Information Sharing for Aviation Safety

Statement of Intent for Industry Organizations* to Become a Member of the Demonstration Project of Asia Pacific Regional Data Collection, Analysis and Information Sharing for Aviation Safety

* Industry Organizations include Air Navigation Service Providers, airlines, manufacturers and associations

Statement of Intent for States and Administrations to Become a Member of the Demonstration Project of Asia Pacific Regional Data Collection, Analysis and Information Sharing for Aviation Safety

This Statement of Intent is made by the State or Administration identified below, hereinafter referred to as "Member". The Member agrees to support the *Demonstration Project of Asia Pacific Regional Data Collection, Analysis and Information Sharing for Aviation Safety* (hereinafter referred to as "Demonstration Project"), which will collect and analyze safety information to advance aviation safety.

The Member agrees to act in accordance with the core principles and responsibilities described in the *Governance Plan for the Demonstration Project of Asia Pacific Regional Data Collection, Analysis and Information Sharing* (hereinafter referred to as "Governance Plan"). Core principles are described in Section 2.0 of this document and responsibilities for all members are detailed in Section 3.0. By signing, Member agrees to use information gained from the Demonstration Project to advance safety goals only and not for punitive or enforcement purposes.

The Member agrees to provide subject matter expertise and remit an annual participation fee for each of the three years of the Demonstration Project. Participation fees are set annually by the Governing Board, consistent with the cost sharing strategy in Table 8-2.

The Member may terminate its involvement in the Demonstration Project at any time and for any reason by providing a minimum of 60 calendar days of notice to the Secretariat. The Governing Board may suspend or terminate a member's involvement in the Demonstration Project if it finds that an organization has violated core principles as described in Section 2.0.

Signed by:

Name_____

Position_____

State or Administration_____

Date_____

Recorded by the Secretariat on _____

Statement of Intent for Industry Organizations to Become a Member of the Demonstration Project of Asia Pacific Regional Data Collection, Analysis and Information Sharing for Aviation Safety

This Statement of Intent is made by the Organization identified below, hereinafter referred to as "Member". The Member agrees to support the *Demonstration Project of Asia Pacific Regional Data Collection, Analysis and Information Sharing for Aviation Safety* (hereinafter referred to as "Demonstration Project"), which will collect and analyze safety information to advance aviation safety.

The Member agrees to act in accordance with the core principles and responsibilities described in the *Governance Plan for the Demonstration Project of Asia Pacific Regional Data Collection, Analysis and Information Sharing* (hereinafter referred to as "Governance Plan"). Core principles are described in Section 2.0 of this document and responsibilities for all members are detailed in Section 3.0.

The Member agrees to contribute de-identified data, results, and/or subject matter expertise during the three years of the Demonstration Project.

The Member may terminate its involvement in the Demonstration Project at any time and for any reason by providing a minimum of 60 calendar days of notice to the Secretariat. The Governing Board may suspend or terminate a member's involvement in the Demonstration Project if it finds that an organization has violated core principles as described in Section 2.0.

Signed by:

Name _____

Position _____

Organization _____

Date _____

Recorded by the Secretariat on _____