Organización de Aviación Civil Internacional
Oficina Regional Sudamericana
Segunda Reunión de Directores de Navegación Aérea y Seguridad Operacional de la Región SAM
(Lima, Perú, 14 al 16 de septiembre de 2015)

Cuestión 2 del Orden del Día: **Declaración de Bogotá: Seguimiento de implantación de las prioridades de seguridad operacional**

SEGUIMIENTO EN LAS METAS CORRESPONDIENTES A LA VIGILANCIA DE LA SEGURIDAD OPERACIONAL, ACCIDENTES Y EXCURSIONES DE PISTA

(Presentado por la Secretaría)

RESUMEN

Esta nota de estudio (NE) presenta información actualizada sobre el seguimiento de las metas de seguridad operacional establecidas en la Declaración de Bogotá, respecto a las siguientes áreas:

- ✓ Vigilancia de la seguridad operacional;
- ✓ accidentes;
- ✓ excursiones de pista;
- ✓ certificación de aeródromos; e
- ✓ implantación del programa estatal de seguridad operacional (SSP) y del sistema de gestión de la seguridad operacional (SMS)

Referencias

- Reunión mundial de coordinación (GCM) de los Grupos regionales de planificación y ejecución (PIRG) y los Grupos regionales de seguridad operacional de la aviación (RASG) (Montreal 19 marzo 2013)
- Informe de la Primera Reunión de Directores de Navegación Aérea y Seguridad Operacional de la Región SAM (Lima, Perú, 21 al 22 de octubre de 2013)
- Primera edición de la versión revisada del Plan global para la seguridad operacional de la aviación (GASP) de la OACI (Doc 10004, 2013)
- Resolución A38-2 – Planificación mundial OACI para la seguridad operacional y la navegación aérea

Objetivos estratégicos de la OACI:	*A – Seguridad operacional*

1 Introducción

1.1 OACI continúa incorporando en todos sus procesos métodos de medición de la performance de sus distintos objetivos estratégicos, mediante el establecimiento de un conjunto de indicadores y métricas y los cuadros de mando públicos de cada región (*performance dashboards*).

1.2 En este sentido, y bajo el principio de transparencia y uso compartido de la información,

la OACI implantó los ***"cuadros de performance regional"*** en su página W*eb* para la medición del rendimiento de las siguientes áreas de seguridad operacional:

- ✓ vigilancia de la seguridad operacional;
- ✓ accidentes e incidentes serios;
- ✓ excursiones e incursiones de pista;
- ✓ certificación de aeródromos; e
- ✓ implementación del Programa estatal de seguridad operacional (SSP) y del sistema de gestión de la seguridad operacional (SMS).

1.3 El cuadro de performance de la Región SAM permitirá a los Estados gestionar la seguridad operacional en base a mediciones. El fundamento de este enfoque se basa en los siguientes principios esenciales de la seguridad operacional:

- ✓ trabajo por resultados; y
- ✓ medir para poder gestionar

1.4 En la Primera edición de la versión revisada del Plan global para la seguridad operacional de la aviación (GASP) de la OACI (Doc 10004, 2013), se establece que el *mejoramiento continuo* de la seguridad operacional de la aviación mundial es fundamental para garantizar que el transporte aéreo siga desempeñando una función importante en impulsar el desarrollo económico y social sostenible en todo el mundo.

1.5 Esta versión revisada del GASP también establece los objetivos mundiales de seguridad operacional de la navegación aérea, así como *los hitos y prioridades* específicas que deben considerar los Estados y los planificadores regionales en la mejora de la seguridad operacional de la aviación.

1.6 Del 21 al 22 de octubre de 2013, se llevó a cabo la Primera Reunión de Directores de Navegación Aérea y Seguridad Operacional de la Región SAM en Lima, Perú. En esta reunión los Directores de seguridad operacional acordaron las siguientes metas de seguridad operacional hasta diciembre de 2016:

- ✓ ***Vigilancia de la seguridad operacional:*** *Alcanzar el 80% de aplicación eficaz (EI) en la Región SAM;*

- ✓ ***Accidentes:*** *Reducir la brecha (GAP) de la tasa de accidentes de la Región SAM en un 50% con relación a la tasa mundial de accidentes;*

- ✓ ***Excursiones de pista:*** *Reducir la tasa de excursiones de pista en un 20% con relación a la tasa promedio de la Región SAM (2007-2012);*

- ✓ **Certificación de aeródromos**: Alcanzar el 20% de aeródromos internacionales certificados; e

- ✓ ***Implementación del programa estatal de seguridad operacional (SSP) y del sistema de gestión de la seguridad operacional (SMS)***

  - ➢ Alcanzar el 67% de implantación del SSP
  - ➢ Alcanzar el 100% de la capacidad de implantación de los SMS de los proveedores de servicios.

1.7 Asimismo, del 4 al 6 de diciembre de 2013, se celebró en Bogotá, la Décimo Tercera Reunión de Autoridades de Aviación Civil de Sudamérica (RAAC/13), en esta reunión, a través de la Declaración de Bogotá, los Estados declararon el compromiso de alcanzar las metas acordadas en la Primera Reunión de Directores de Navegación Aérea y Seguridad Operacional de la Región SAM.

2 Seguimiento de las metas acordadas en la Declaración de Bogotá

2.1 *Vigilancia de la seguridad operacional – Aplicación eficaz*

2.1.1 Entre los años 2011 y 2012 la OACI llevó a cabo la transición al enfoque de observación continua (CMA) del Programa universal de auditoría de la vigilancia de la seguridad operacional (USOAP) y, a partir de enero 2013, el CMA del USOAP fue implantado de manera definitiva.

2.1.2 Desde noviembre 2011 hasta agosto 2015, la OACI llevó a cabo seis (06) misiones de validación coordinadas de la OACI (ICVM) a los siguientes Estados de Sudamérica: Colombia (2011); Ecuador y Surinam (2012); Argentina y Venezuela (2013) y Uruguay (2014). Así mismo realizó dos (02) auditorías CMA a Bolivia (2013) y Perú (2014) respectivamente y una (01) actividad ex situ a Brasil (2015).

2.1.3 Durante este período, los Estados SAM mejoraron su EI de la siguiente manera: Colombia **16%**, Ecuador **12.4%**, Surinam **9.6%**, Argentina **9.1%**, Venezuela **10.9%**, Perú **6.21%**, Uruguay **16.66%** y Brasil **(1.72%)**. El único Estado que no mejoró su EI fue Bolivia que redujo la EI de 72.08 a 67.99% (**- 4.09%**).

2.1.4 En base a los resultados obtenidos, la EI promedio de la Región SAM aumentó de **66.31%** en 2011 a **72.08%** en agosto 2015, es decir un **5.77%**, lo cual representa un promedio de mejora por actividad de **0.64%** aproximadamente.

2.1.5 Considerando que hasta diciembre de 2016, la Región SAM debe mejorar su EI en **8%** para cumplir con la meta de la Declaración de Bogotá, se requiere que Panamá, Ecuador, Brasil, Guyana, Paraguay y Bolivia, mejoren sus promedios individuales en **17.34%** durante las actividades CMA programadas en 2015 y 2016.

2.1.6 Asimismo, Argentina, Venezuela, Colombia, Perú, Chile, Uruguay y Surinam pueden solicitar una actividad ex situ, para apoyar a la Región SAM a lograr la meta del 80%, siempre y cuando hayan completado más del 50% de sus planes de medidas correctivas (CAPs).

2.1.7 En el ***Apéndice A*** de esta NE se presenta un análisis detallado de los indicadores, metas y medidas de mitigación para la mejora del área de vigilancia de la seguridad operacional.

2.2 *Accidentes*

2.2.1 De acuerdo a la meta establecida en la Declaración de Bogotá, la Región SAM, a partir del 2014, debía *reducir la brecha (GAP) de la tasa de accidentes en 50% con relación a la tasa mundial de accidentes.*

2.2.2 Considerando los datos obtenidos del sitio SPACE iSTARS 2.0 de OACI y tomando como base los datos de 2013, se puede observar en la siguiente figura que la tasa de accidentes de la Región SAM para aeronaves de más de 5.700 kg en operaciones regulares de transporte aéreo comercial ha tenido el siguiente rendimiento desde 2014. Durante el 2014, la meta era reducir el GAP a 0.35, no obstante, el GAP de ese año fue de 0.5, por lo que la meta no fue superada por estar 0.15 por encima de la

misma. Para el 2015, la meta es reducir el GAP a 0.25. Hasta el 31 de agosto de 2015, el GAP fue de 1.7 a favor por no haber ocurrido accidentes en la Región SAM hasta esa fecha.

	2013	**2014**	**2015**
Tasa SAM	3.6	4.6	**0**
Tasa mundial	2.9	4.1	1.7
GAP	0.7	**- 0.5**	**+ 1.7**
50% del GAP	**- 0.35**	**- 0.25**	
Resultados	Inicio del ejercicio	0.15 sobre la meta	Meta superada hasta el 31 de agosto de 2015

2.2.3 En el ***Apéndice B*** de esta NE se presenta un análisis pormenorizado de los indicadores, metas y medidas de mitigación para la mejora de los accidentes de aviación.

2.3 ***Excursiones de pista***

2.3.1 La meta acordada en la Declaración de Bogotá respecto a las excursiones de pista fue la siguiente: *Reducir la tasa de excursiones de pista en un 20% con relación a la tasa promedio de la Región SAM (2007-2012).*

2.3.2 Los indicadores de rendimiento para las excursiones de pista de la Región SAM se obtuvieron de la aplicación ADREP del sitio SPACE iSTARS 2.0 de la OACI. La información tomada para las muestras fue para todo tipo de operación con aeronaves sobre **5 700** ***kg*** y para accidentes ocurridos por Estado de suceso desde 2007 hasta el 31 de Agosto del 2015.

2.3.3 La tasa promedio de excursiones de pista entre 2007 y 2012 fue de **2.24** accidentes por un millón de salidas. Al reducir el 20% a la tasa de 2.24 %, la meta de la Región SAM se ajusta a una tasa de **1.80** accidentes por un millón de salidas.

2.3.4 Al analizar la información de los indicadores de la Región SAM, se puede observar una disminución de los accidentes desde 2007 hasta el 31 de agosto de 2015, alcanzando una tasa de 0 en el 2012, 1.56 en el 2013, 0.51 en el 2014 y de 0 hasta el 31 de agosto de 2015, por lo que la Región SAM se encuentra cumpliendo la meta establecida en la Declaración de Bogotá para excursiones de pista.

2.3.5 En el ***Apéndice C*** de esta NE se presenta un análisis detallado de los indicadores, metas y medidas de mitigación para mejorar la tasa de accidentes por excursiones pista.

2.4 **Certificación de aeródromos**

2.4.1 En la NE/08 se presenta información concerniente a esta meta.

2.5 ***Implementación del programa estatal de seguridad operacional (SSP) y del sistema de gestión de la seguridad operacional (SMS***

2.5.1 En la NE/09 se presenta información concerniente a esta meta.

3. Acciones sugeridas

3.1 Se invita a la reunión de Directores de seguridad operacional a:

a) tomar conocimiento de la información presentada en esta nota de estudio y apéndices; y

b) analizar y comentar sobre:

- ✓ el desempeño de los indicadores;
- ✓ la situación actual de las metas de rendimiento de seguridad operacional; y
- ✓ las propuestas de medidas de mitigación para cada área analizada.

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APÉNDICE A

VIGILANCIA DE LA SEGURIDAD OPERACIONAL

1. Indicadores de rendimiento de seguridad operacional

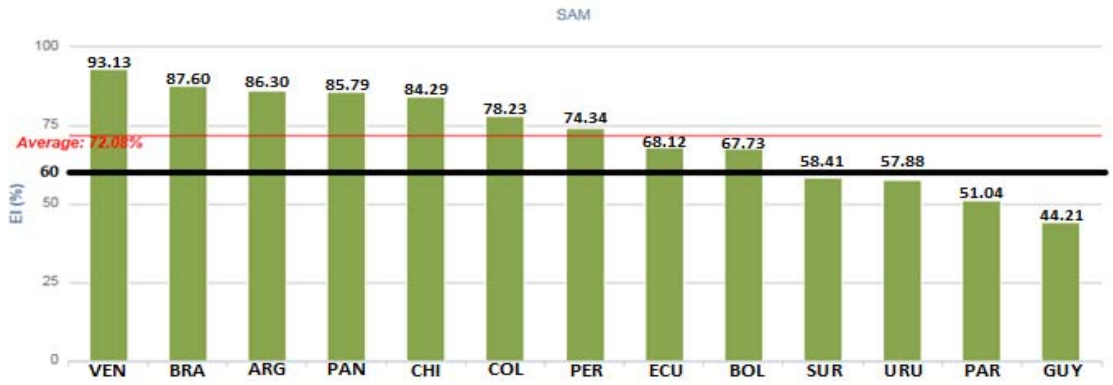
1.1 Una vez que inició el período de transición del enfoque de observación continua (CMA) del programa universal de auditoría de la vigilancia de la seguridad operacional (USOAP) en 2011, la aplicación eficaz (EI) promedio de la Región SAM aumentó de 66.31% a **72.08%** en nueve (09) actividades del CMA del USOAP, es decir **5.77%**, lo cual representa un promedio de mejora por Estado de aproximadamente **0.64%.**

1.2 Desde noviembre de 2011 hasta agosto de 2015, los siguientes Estados recibieron una actividad del CMA del USOAP:

- ✓ **Misión de validación coordinada de la OACI (ICVM):** Colombia en 2011; Ecuador y Surinam en 2012; Argentina y Venezuela en 2013 y Uruguay en 2014.
- ✓ **Auditorías CMA:** Bolivia en 2013 y Perú en 2014.
- ✓ **Actividad ex situ:** Brasil en 2015

1.3 De acuerdo con la Tabla A-1 – Aplicación eficaz (EI) promedio de la Región SAM (actualizada hasta agosto de 2015), siete (7) Estados (Venezuela, Brasil, Argentina, Panamá, Chile, Colombia y Perú) están por encima del promedio de la Región (72.08%), dos (2) Estados (Ecuador y Bolivia) están muy cerca de alcanzar el promedio y cuatro (4) Estados (Surinam, Uruguay, Paraguay y Guyana) están por debajo del promedio referido.

Tabla A-1 – Aplicación eficaz (EI) promedio de la Región SAM



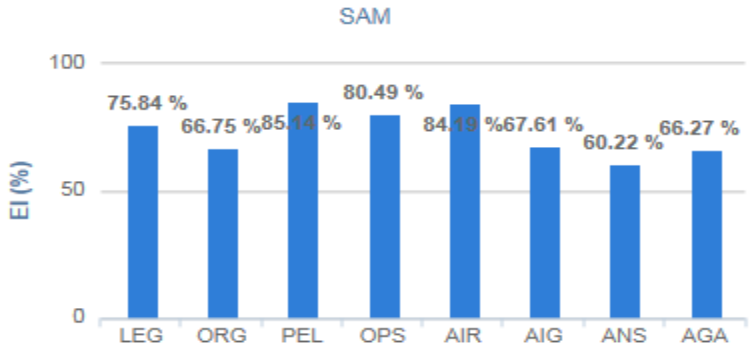
1.4 Después de las actividades realizadas durante el período 2011-2015, los Estados SAM mejoraron su EI de la siguiente manera: Colombia **16%**, Ecuador **12.4%**, Surinam **9.6%**, Argentina **9.1%**, Venezuela **10.9%**, Perú **6.21%**, Uruguay **16.66%** y Brasil **1.72%**. El único Estado que no mejoró su EI fue Bolivia que redujo la EI de 72.08 a 67.99% (**- 4.09%**).

1.5 Para mejorar el promedio de aplicación eficaz (EI) general de la Región SAM, se requiere que Ecuador, Bolivia, Surinam, Paraguay, Guyana y Uruguay avancen en la solución de las constataciones dejadas en las últimas actividades del CMA del USOAP de la OACI o en el último ciclo de auditorías según el enfoque sistémico global (CSA). La Oficina Regional continuará apoyando a los Estados con asesoría directa y continua en la preparación de sus CAP para enfrentar las actividades del CMA del USOAP.

1.6 En la Tabla A-2 – Aplicación eficaz (EI) promedio por área de auditoría, se puede observar que las áreas de LEG, PEL, OPS y AIR están por encima del promedio de la Región, mientras que ANS, AGA, ORG y AIG están por debajo de la misma.

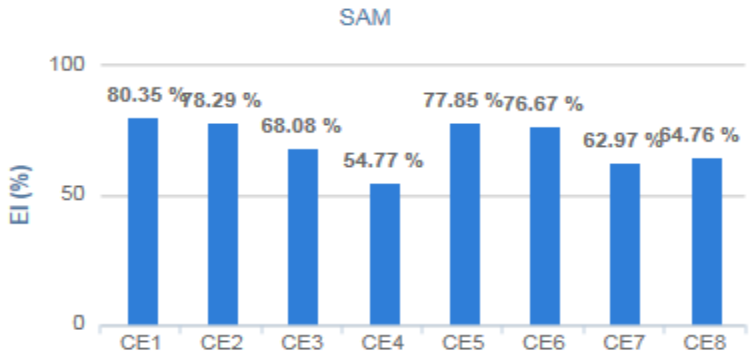
1.7 Para mejorar la aplicación eficaz de las áreas de auditoría es necesario que los Estados trabajen con mayor esfuerzo en ANS (60.22%), AGA (66.27%), ORG (66.75%) y AIG (67.75%).

Tabla A-2 – Aplicación eficaz (EI) promedio por área de auditoría



1.8 En la Tabla A-3 - Aplicación eficaz (EI) promedio por elemento crítico (CE), se puede visualizar que los CE 1, 2, 5 y 6 se encuentran por encima del promedio (72.08%), mientras que los CE 3, 4, 7 y 8 están por debajo del promedio, siendo el CE-4 - Cualificación e instrucción del personal técnico el que debe ser mejorado en mayor grado. El CE-4 tiene una EI de 54.77%.

Tabla A-3 – Aplicación eficaz (EI) promedio por elemento crítico



1.9 Para lograr mejorar el CE-4, los Estados deberían implantar un sistema efectivo de **definición y control** de **competencias**. La definición de competencias involucra temas como la existencia de un manual de descripción de puestos que incluya el perfil de cada puesto de inspector de seguridad operacional, también para cada tarea que desempeñan los inspectores se necesita establecer los requisitos de **conocimiento**, **actitud**, **experiencia** y **habilidades** para que puedan desempeñar de forma efectiva sus tareas. Un inspector de seguridad operacional no debería asignársele ninguna tarea sin supervisión si no se tiene evidencia documentada que muestre su capacidad para desempeñar la tarea, ya sea, de certificación o vigilancia.

2. Propuestas de mejoras de seguridad operacional

2.1 Mejora en la aplicación eficaz (EI) promedio de la Región SAM

2.1.1 Para alcanzar el 80% de la meta establecida en la Declaración de Bogotá, se requiere que los siguientes seis (06) Estados mejoren su promedio individual en **17.34%**: Panamá, Ecuador, Brasil, Guyana, Paraguay y Bolivia. Dichos Estados recibirán una actividad CMA en 2015 y 2016 respectivamente.

2.1.2 Asimismo, Argentina, Venezuela, Colombia, Perú, Chile, Uruguay y Surinam pueden solicitar una actividad ex situ, para apoyar a la Región SAM a lograr la meta del 80%, siempre y cuando hayan completado más del 50% de sus planes de medidas correctivas (CAPs).

2.1.3 Además de la mejora de los CAPs, se propone las siguientes mejoras de seguridad operacional específicas para los Estados SAM y para los Estados del Sistema Regional de Cooperación para la Vigilancia de la Seguridad Operacional (SRVSOP), durante el período **2016-2019**:

2.1.3.1 Para los Estados de Sudamérica y del SRVSOP

- ✓ Alcanzar el 80% de armonización de los reglamentos de los Conjuntos LAR relativos a PEL, OPS, AIR, AGA, ANS y AIG;
- ✓ armonización del material guía para los inspectores;
- ✓ armonización del material guía para los proveedores de servicios, por ejemplo, circulares de asesoramiento (CA), métodos aceptables de cumplimiento (MAC) y material explicativo e interpretativo (MEI);
- ✓ asistencia a los Estados que lo requieran en las siguientes áreas:
  - ➢ CMA del USOAP;
  - ➢ SSP/SMS;
  - ➢ certificación;
  - ➢ vigilancia;
  - ➢ aprobaciones;
  - ➢ capacitación, etc.
- ✓ Implantación eficaz de los siguientes sistemas de vigilancia para explotadores de servicios aéreos:
  - ➢ Programa de intercambio de datos de inspecciones de seguridad en rampa (IDISR); y

- Programa de vigilancia coordinada de mercancías peligrosas (VCMP) (miembros del SRVSOP).
- Registro del certificado de explotador de servicios aéreos (AOC)

2.2 Mejora en la aplicación eficaz (EI) por área de auditoría

2.2.1 ANS

✓ Período enero 2015 - diciembre 2019:

- Desarrollo de los LAR ANS.
- Desarrollo de material de orientación LAR ANS.
- Armonización de la reglamentación ANS entre los Estados SAM.
- Implantación eficaz de los requisitos y procedimientos ANS.
- Implantación del SMS en los proveedores ANS.

2.2.2 AGA (Véase NE/08)

2.3 Mejora en la aplicación eficaz (EI) por elemento crítico

2.3.1 CE- 4 - Cualificación e instrucción del personal técnico

✓ Período enero 2016 - diciembre 2019:

- Estandarización de los programas de instrucción de los inspectores de los Estados SAM.
- Apoyo del SRVSOP con cursos de capacitación para los Estados que lo soliciten.
- Desarrollo y aplicación eficaz de un sistema de capacitación multinacional con aplicaciones a través de la página Web de la Oficina Regional Sudamericana de la OACI y del SRVSOP.

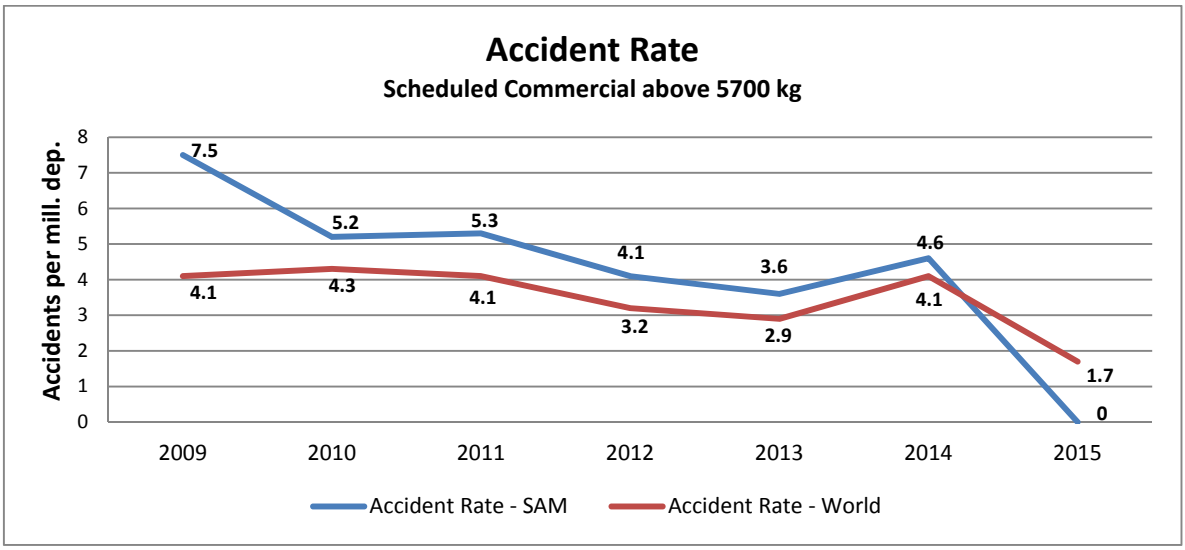
APÉNDICE B

ACCIDENTES

1. Indicadores de rendimiento de seguridad operacional

1.1 En la Tabla B-1a de abajo, se puede apreciar que la tasa de accidentes en la Región ha ido decreciendo paulatinamente hasta 2013, no obstante hay un ligero aumento en dicha tasa en el año 2014 y una drástica disminución en el 2015, año en que no se ha registrado ningún accidente hasta el 31 de agosto. La tabla también presenta la diferencia entre la tasa de la Región SAM (en línea de color azul) y la tasa mundial (en línea de color granate)

Tabla B-1a – Tasa de accidentes



1.2 De acuerdo a la meta establecida en la Declaración de Bogotá, la Región SAM, a partir del 2014, debía *reducir la brecha (GAP) de la tasa de accidentes en 50% con relación a la tasa mundial de accidentes.*

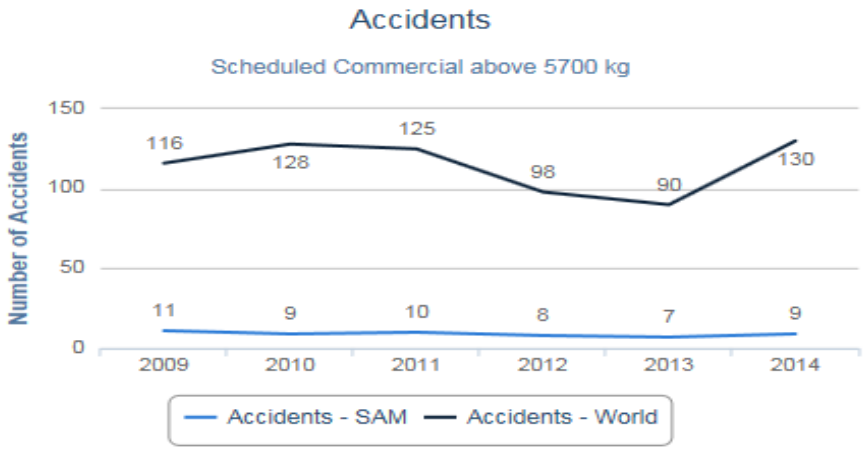
1.3 Considerando los datos obtenidos del sitio SPACE iSTARS 2.0 de OACI y tomando como base los datos de 2013, se puede observar en la siguiente figura que la tasa de accidentes de la Región SAM para aeronaves de más de 5.700 kg en operaciones regulares de transporte aéreo comercial ha tenido el siguiente rendimiento desde 2014. Durante el 2014, la meta era reducir el GAP a 0.35, no obstante, el GAP de ese año fue de 0.5, por lo que la meta no fue superada por estar 0.15 por encima de la misma. Para el 2015, la meta es reducir el GAP a 0.25. Hasta el 31 de agosto de 2015, el GAP fue de 1.7 a favor por no haber ocurrido accidentes en la Región SAM hasta esa fecha.

	2013	**2014**	**2015**
Tasa SAM	3.6	4.6	**0**
Tasa mundial	2.9	4.1	1.7
GAP	0.7	**- 0.5**	**+ 1.7**
50% del GAP	**- 0.35**	**- 0.25**	
Resultados	Inicio del ejercicio	0.15 sobre la meta	Meta superada hasta el 31 de agosto de 2015

1.4 La información que presentan las tablas anteriores es para accidentes ocurridos en operaciones de transporte aéreo comercial regular con aeronaves con un peso superior a 5 700 kg.

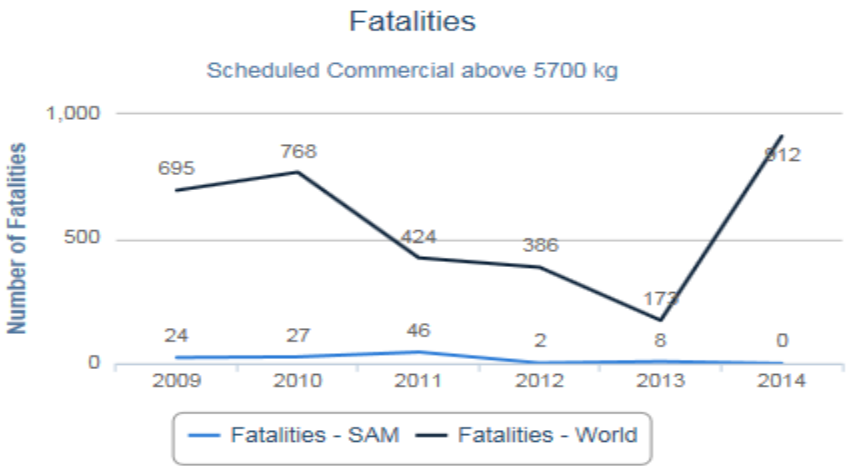
1.5 En la Tabla B-1b – Número de accidentes, se puede visualizar que el número de accidentes en la Región SAM permanece casi constante durante el período 2009-2014. También se puede visualizar la diferencia entre la tasa de la Región SAM (en línea azul) y la tasa mundial (en línea granate)

Tabla B-1b – Número de accidentes



1.6 La Tabla B-1c – Número de fatalidades, muestra el número de fatalidades por año en la Región SAM. En esta tabla se puede apreciar que las fatalidades han ido disminuyendo hasta llegar a cero (0) en 2014. Esta tabla también muestra la diferencia entre el número de fatalidades de la Región SAM (en línea azul) y el número de fatalidades a nivel global (en línea granate).

Tabla B-1c – Número de fatalidades



2. Método para el cálculo de las metas de rendimiento de seguridad operacional.

2.1 **Método basado en un proceso de análisis de riesgos retrospectivo que utiliza mejoras de seguridad operacional**

2.1.1 Este método se basa en un proceso de análisis de riesgos retrospectivo que evalúa la efectividad de las mejoras propuestas para cada evento o condición seleccionada. Esto se logra mediante la evaluación de la oportunidad que habría tenido la mejora para prevenir el evento si ésta habría sido aplicada hipotéticamente antes que se produzca ese evento.

2.1.2 Al respecto, el Equipo de Seguridad Operacional de la Aviación Comercial (CAST), una asociación de la industria de la aviación del gobierno de los Estados Unidos, dedicada a reducir la tasa de mortalidad de la aviación comercial en su país y en el mundo, llevó a cabo un análisis de riesgos de los accidentes ocurridos en la Región SAM durante el período 2002-2012 *(Véase el Adjunto 1 de este apéndice)*, en el que aplicó las siguientes nueve (9) mejoras de seguridad operacional (SE) del Grupo Regional de Seguridad Operacional de la Aviación – Pan América (RASG-PA): *RE/04, RE/09, CFIT/02, CFIT/04, LOC-I/06, LOC-I/07, LOC-I/9, RE/8 y RE/11 (Véanse las mejoras de seguridad operacional del RASG-PA en el Adjunto 2 a este apéndice)*.

2.1.3 Mediante este análisis y la aplicación de factores de ponderación tanto a los riesgos como a la severidad de los eventos, el CAST determinó que se pudo haber eliminado un **18.9%** del total de los accidentes ocurridos en el período 2002-2012 en la región SAM.

2.1.4 Utilizando el dato de 18.9%, es posible determinar el número de accidentes que pudieron haber sido evitados en el período 2002 – 2012 en el evento de haber aplicado las 9 SE, para esto, se aplica el 20% (18.9%) al promedio de 10 (10.7) accidentes ocurridos en los últimos 11 años (2002-2012), obteniéndose un resultado de 2 accidentes menos.

2.1.5 En el evento que todos los Estados SAM aplicarían uniformemente las 9 SE, se podría prever una disminución de 2 accidentes de los 10 accidentes promedio actuales, quedando 8 accidentes para el período 2014-2018. Con respecto al número de salidas, se estima que para el año 2016 (año intermedio del período 2014-2018) habrán 2,150.000 salidas en operaciones regulares en base a un crecimiento anual del 3.1%. Con estos datos se obtiene una tasa de **3.72** accidentes anuales por cada millón de salidas [8 x 1,000.000 ÷ 2,150.000 = 3.72] que sería la meta de rendimiento propuesta hasta el año 2018 en caso de aceptar esta metodología.

3. Propuestas de metas de rendimiento de seguridad operacional

3.1 Considerando que la meta de la Declaración de Bogotá se cumple este diciembre de 2016 y para que la meta no varía de año a año, se sugiere que la reducción del 50% se aplique a la brecha que ha ocurrido entre los promedios de las tasas de la Región SAM y tasas mundiales de los últimos cinco (5) años de los cuales se tenga datos disponibles.

4. Principales categorías de accidentes mortales en la Región SAM

4.1 Las siguientes son las tres categorías principales de accidentes mortales a ser consideradas en la Región:

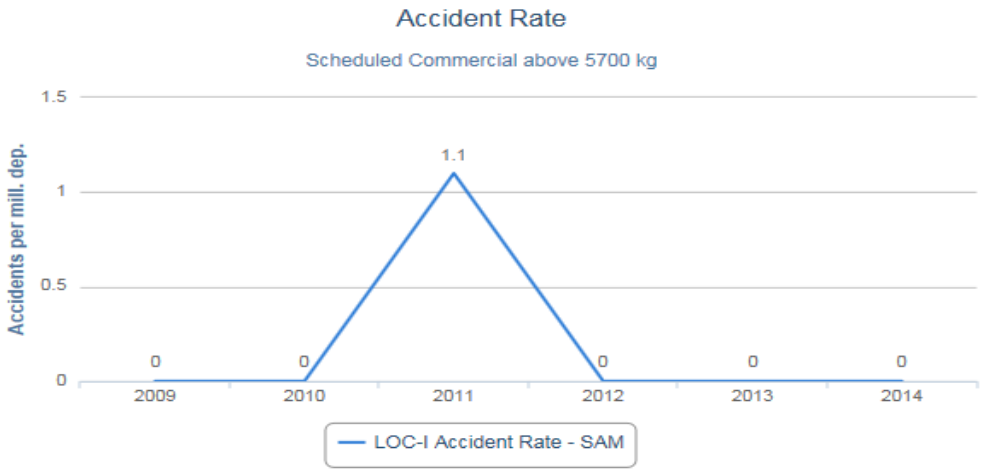
- ✓ pérdida de control en vuelo (LOC-I);

- ✓ excursiones de pista (RE); e
- ✓ impacto contra el suelo sin pérdida de control (CFIT).

4.2 Pérdida de control en vuelo (LOC-I)

4.2.1 La Tabla B-4a – Tasa de accidentes por LOC – I, muestra una proyección lineal de cero (0) accidentes durante el período 2009-2014, excepto en 2011, donde se registraron (2) dos accidentes que produjeron una tasa de 1.1 accidentes por un millón de salidas y causó 38 fatalidades.

Tabla B-4a – Tasa de accidentes por LOC-I

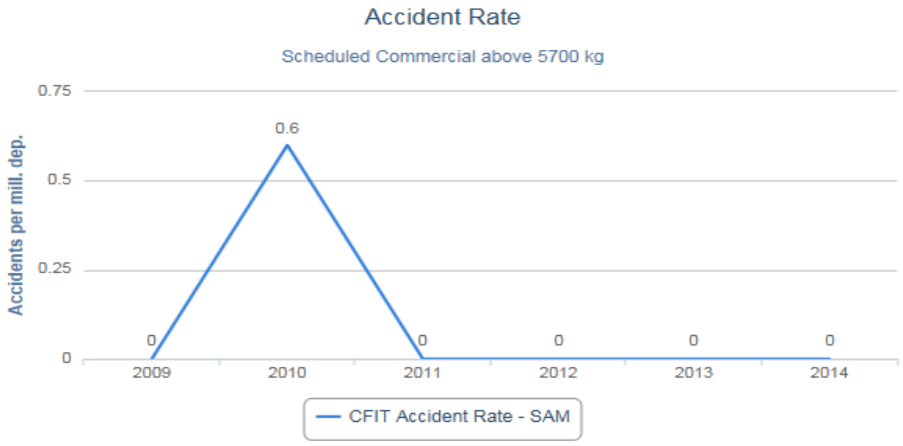


4.3 Excursiones de pista (RE) (Véase Apéndice C de esta nota de estudio)

4.4 Impacto contra el suelo sin pérdida de control (CFIT)

4.4.1 En la Tabla B-4b, se puede observar que en 2009 y desde 2011 hasta 2014 no se registraron accidentes por CFIT. En 2010 se registró un (1) accidente que produjo una tasa de 0.6 accidentes por un millón de salidas y no causó fatalidades.

Tabla B-4b – Tasa de accidentes por CFIT



5. Propuestas de mejoras de seguridad operacional

5.1 Para las categorías de pérdida de control en vuelo (LOC-I), excursiones de pista (RE) e impacto contra el suelo sin pérdida de control (CFIT), se proponen las siguientes mejoras de seguridad operacional:

5.1.1 Pérdida de control en vuelo (LOC-I)

- ✓ Período 2017-2019:
  - ➢ Implantación eficaz en todos los Estados SAM de los requisitos relativos a la instrucción para la prevención y recuperación del control de la aeronave (UPRT). Estos requisitos permitirán mitigar los sucesos relacionados con la pérdida de control de la aeronave en vuelo. Las normas del Anexo 1 y Anexo 6, Parte I, así como los requisitos de los LAR 121 y 135 son aplicables a partir del 13 de noviembre de 2014.
  - ➢ Implantación eficaz de sistemas reactivos y proactivos de recopilación de datos, identificación de peligros y gestión de los riesgos relacionados con LOC-I.
  - ➢ Implantación eficaz del programa de cualificación avanzada (AQP) o de la instrucción basada en la evidencia (EBT) de OACI, según corresponda.
  - ➢ Implantación eficaz de sistemas predictivos de recopilación de datos, identificación de peligros y gestión de los riesgos relacionados con LOC-I.
  - ➢ Implantación de un sistema avanzado de supervisión que incluya los procesos reactivo, proactivo y predictivo orientados a LOC-I.

5.1.2 **Excursiones de pista (RE).-** Los indicadores y metas de rendimiento de esta categoría de accidentes mortales, así como sus mejoras de seguridad operacional se detallan en el Apéndice C de esta NE.

5.1.3 Impacto contra el suelo sin pérdida de control (CFIT)

- ✓ Período 2017-2019:
  - ➢ Continuar con la implantación eficaz en todos los Estados SAM de la ayuda de instrucción CFIT que contiene el conjunto de material didáctico (tool kit) ALAR de la Fundación para la seguridad operacional de los vuelos (FSF).
  - ➢ Implantación eficaz de sistemas reactivos y proactivos de recopilación de datos, identificación de peligros y gestión de los riesgos relacionados con CFIT.
  - ➢ Implantación eficaz del programa de cualificación avanzada (AQP) o de la instrucción basada en la evidencia (EBT) de OACI, según corresponda.
  - ➢ Implantación eficaz de sistemas predictivos de recopilación de datos, identificación de peligros y gestión de los riesgos relacionados con CFIT.
  - ➢ Implantación de un sistema avanzado de supervisión que incluya los procesos reactivo, proactivo y predictivo orientados al CFIT.

CAST Spreadsheet Tool
Panamanian and South American Operator Accidents

RASG-PA Safety Enhancements

RE/04, RE/09, CFIT/02, CFIT/04, LOC-I/06, LOC-I/07, LOC-I/9, RE/8, RE/11

Accident Set Used For Evaluation

2002-2012 Hull Loss and Fatal Accidents (46) - (Panamanian and South American Domicile Operators With Operations Similar to Part 121)

Notes:

Preliminary Assessment (SE Effectiveness Values) performed by FAA AVP-200;

A Preliminary SE Implementation Value of 50% was used for all 9 SEs
(Portion of Fleet or Risk Population with SE Implemented)

Date	Airplane	Jet/Turbo Prop	Airline	Location	Portion of Event Eliminated	Safety Enhancement								
						RE/04	RE/09	CFIT/02	CFIT/04	LOC-I/06	LOC-I/07	LOC-I/9	RE/8	RE/11
						Implementation Value				Implementation Value				
						.500	.500	.500	.500	.500	.500	.500	.500	.500
						Safety Enhancement Effectiveness (%/100)				Safety Enhancement Effectiveness (%/100)				
1/28/2002	B727-100	Jet	TAME	(near) Ipiales	.420	.150	.100	.375	.150	.050	.000	.200	.000	.000
3/18/2002	B727	Jet	VARIG	Belo Horizonte, BR	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
6/14/2002	DC-9	Jet	Inter (Colombia)	Neiva, CO	.487	.300	.300	.000	.200	.250	.150	.050	.000	.000
8/30/2002	Fokker 100	Jet	TAM Linhas Aereas	Birigui, BR	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
8/30/2002	EMB-120 Brasilia	TP-Small	RICO Linhas Aereas	(near) Rio Branco,	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
9/14/2002	ATR 42	TP-Large	Total Linhas Aereas	(near) Paranapane	.220	.000	.050	.000	.000	.000	.400	.000	.000	.000
1/9/2003	Fokker F.28	Jet	TANS	(near) Chachapoya	.462	.300	.100	.150	.400	.000	.000	.200	.000	.000
1/26/2003	B737 (JT8D)	Jet	VASP	Rio Branco, BR	.306	.000	.050	.150	.000	.200	.200	.100	.000	.000
10/20/2003	Fokker F.27	TP-Large	TAVAJ	Tarauaca, BR	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
10/26/2003	Fairchild FH-227	TP-Large	CATA Linea Aerea SA	(near) Buenos Aire	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
12/13/2003	B737 (JT8D)	Jet	Nuevo Continente	Lima, PE	.522	.500	.300	.000	.000	.000	.000	.500	.000	.000
12/18/2003	DC-9	Jet	Lineas Aereas Suram	(near) Mitu, CO	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
5/14/2004	EMB-120	TP-Small	RICO Linhas Aereas	(near) Manaus, BR	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
10/23/2004	B707	Jet	Beta Cargo	Manaus, BR	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
11/18/2004	Jetstream 31	TP-Small	Venezolana	Caracas, VE	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
1/8/2005	MD-80	Jet	AeroRepublica Colomb	Cali, CO	.469	.500	.200	.000	.300	.100	.000	.050	.000	.000
2/22/2005	Convair 580	TP-Large	TAM - Transporte Aer	Trinidad, BO	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
4/7/2005	Fokker F.28	Jet	ICARO Air	Coca, EC	.213	.300	.000	.000	.000	.000	.000	.050	.100	.000
8/16/2005	MD-80	Jet	West Caribbean Airw	(near) Machiques,	.536	.000	.000	.000	.050	.300	.600	.400	.000	.000
8/23/2005	B737 (JT8D)	Jet	TANS	(near) Pucallpa, PE	.563	.500	.100	.150	.400	.000	.300	.050	.000	.000
4/16/2006	Fokker F.27	TP-Large	TAM - Transporte Aer	Guayaramerin, BO	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
6/1/2006	Jetstream 31	TP-Small	Air Panama	Bocas de Toro, PA	.166	.200	.000	.000	.000	.000	.000	.050	.100	.000
8/17/2006	B727	Jet	Aerosucre Colombia	Bogota, CO	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
9/29/2006	B737 (NG)	Jet	GOL Linhas Aereas	(near) Peixote Aze	.145	.000	.000	.000	.100	.000	.000	.200	.000	.000
11/17/2006	DC-10	Jet	Cielos Airlines	Barranquilla, CO	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
11/18/2006	B727	Jet	Aerosucre Colombia	(near) Leticia, CO	.541	.400	.100	.150	.550	.000	.000	.200	.000	.000
2/4/2007	DC-8-71F	Jet	Tampa Cargo	MIAMI	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
7/17/2007	Airbus A320	Jet	TAM Linhas Aereas	Sao Paulo, BR	.248	.200	.000	.000	.100	.100	.000	.050	.100	.000
7/17/2007	EMB 190	Jet	AeroRepublica Colomb	Santa Marta, CO	.707	.500	.125	.150	.400	.500	.000	.500	.000	.000
10/31/2007	Fokker F.27	TP-Large	Air Panama	Panama City, PA	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
1/28/2008	Dash 8-200	TP-Large	Aires Colombia	Bogota, CO	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
2/1/2008	B727-200	Jet	LAB	Near Trinidad	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
2/21/2008	ATR-42-300	TP-Large	Santa Barbara Airlines	(near) Merida, VE	.575	.050	.000	.400	.500	.200	.300	.100	.000	.000
7/23/2008	F.27-400	TP-Large	TAM - Transporte Aer	70nm from Guayar	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
9/22/2008	F-28-4000	Jet	ICARO	QUITO	.231	.200	.000	.000	.200	.000	.000	.000	.100	.000
10/16/2008	B737-200	Jet	Rutaca	CARACAS	.188	.200	.000	.000	.100	.000	.000	.000	.100	.000
5/17/2009	DHC-6-300	TP-Small	Aeroperlas	Carti, PA	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
5/5/2010	ERJ-145LR	Jet	SATENA	Mitu-Fabio, Colombi	.373	.500	.100	.000	.100	.100	.000	.050	.000	.000
8/16/2010	B737-73V (WL)	Jet	AIRES Colombia	San Andres, Colom	.375	.500	.100	.000	.200	.000	.000	.050	.000	.000
9/13/2010	ATR-42-320	TP-Large	Conviasa	Puerto Ordaz, Ven	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
1/25/2010	Embraer 110C Ban	TP-Small	Piquiatuba Táxi Aéreo	near Senador José	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
5/18/2011	SF34A (26)	TP-Large	SOL Líneas Aéreas	Prahuaniyeu, Arge	.123	.000	.000	.000	.200	.000	.050	.000	.000	.000
9/6/2011	SA-227BC Metro III	TP-Small	Aerocon	Trinidad, Bolivia	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
9/16/2011	EMB 190(5)	Jet	TAME	Quito,Ecuador	.390	.500	.100	.150	.000	.000	.000	.050	.100	.000
9/26/2011	DC-9(35)	Jet	Aeropostal	Puerto Ordaz,Vene	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
8/24/2012	Boeing (McDonnell-	Jet	Aserca Airlines	Mayor Buenaventu	.451	.500	.100	.150	.200	.100	.000	.050	.000	.000

Category Definition	Number of Events by Category	Sum total of severity by category	% Severity by category	% Events by category	% of Category Severity Eliminated	Total Events Eliminated by Category	Total Severity Eliminated by Category	% Total Fatality Risk Eliminated	% Total Events Eliminated	1	2	3	4	5	6	7	8	9
										Safety Enhancement								
										RE/04	RE/09	CFIT/02	CFIT/04	LOC-I/06	LOC-I/07	LOC-I/9	RE/8	RE/11
										Implementation Value								
										0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
										Severity eliminated by SE								
CFIT	8.00	6.06	42.1%	17.4%	36.8%	2.87	2.23	15.5%	6.2%	0.55	0.17	0.57	0.88	0.13	0.21	0.36	0.00	0.00
LOC-I	6.00	5.33	37.1%	13.0%	16.5%	0.88	0.88	6.1%	1.9%	0.00	0.03	0.00	0.13	0.15	0.53	0.20	0.00	0.00
RE-Landin	13.00	1.22	8.5%	28.3%	20.3%	3.01	0.25	1.7%	6.5%	0.10	0.00	0.00	0.05	0.05	0.00	0.03	0.05	0.00
SCF-PP	2.00	0.03	0.2%	4.3%	0.0%	0.00	0.00	0.0%	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SCF-NP	5.00	0.00	0.0%	10.9%		0.00	0.00	0.0%	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Midair	1.00	1.00	7.0%	2.2%	14.5%	0.15	0.15	1.0%	0.3%	0.00	0.00	0.00	0.05	0.00	0.00	0.10	0.00	0.00
FUEL	2.00	0.00	0.0%	4.3%		0.00	0.00	0.0%	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RE-Takeof	2.00	0.00	0.0%	4.3%		0.23	0.00	0.0%	0.5%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UNK	1.00	0.52	3.6%	2.2%	0.0%	0.00	0.00	0.0%	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WSTRW	0.00	0.00	0.0%	0.0%		0.00	0.00	0.0%	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
USOS	3.00	0.22	1.5%	6.5%	2.7%	0.59	0.01	0.0%	1.3%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ADRM	0.00	0.00	0.0%	0.0%		0.00	0.00	0.0%	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ARC	3.00	0.00	0.0%	6.5%		0.99	0.00	0.0%	2.2%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FIRE-NI	0.00	0.00	0.0%	0.0%		0.00	0.00	0.0%	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ramp	0.00	0.00	0.0%	0.0%		0.00	0.00	0.0%	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.0%	0.0%		0.00	0.00	0.0%	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	46	14.39				8.7	3.5	24.4%	18.9%	.7	.2	.6	1.1	.3	.7	.7	.1	.0
	Events	Total Severity																

JIMDAT Score (Percentage of Risk and Accidents Eliminated by SE Acting on its Own)

	1	2	3	4	5	6	7	8	9
	RE/04	RE/09	CFIT/02	CFIT/04	LOC-I/06	LOC-I/07	LOC-I/9	RE/8	RE/11
% Fatality Risk Eliminated 24.4%	4.6%	1.4%	3.9%	7.7%	2.3%	5.1%	4.8%	0.3%	0.0%
% Total Event Eliminated 18.9%	6.8%	2.0%	2.0%	4.5%	2.1%	2.2%	3.2%	0.7%	0.0%

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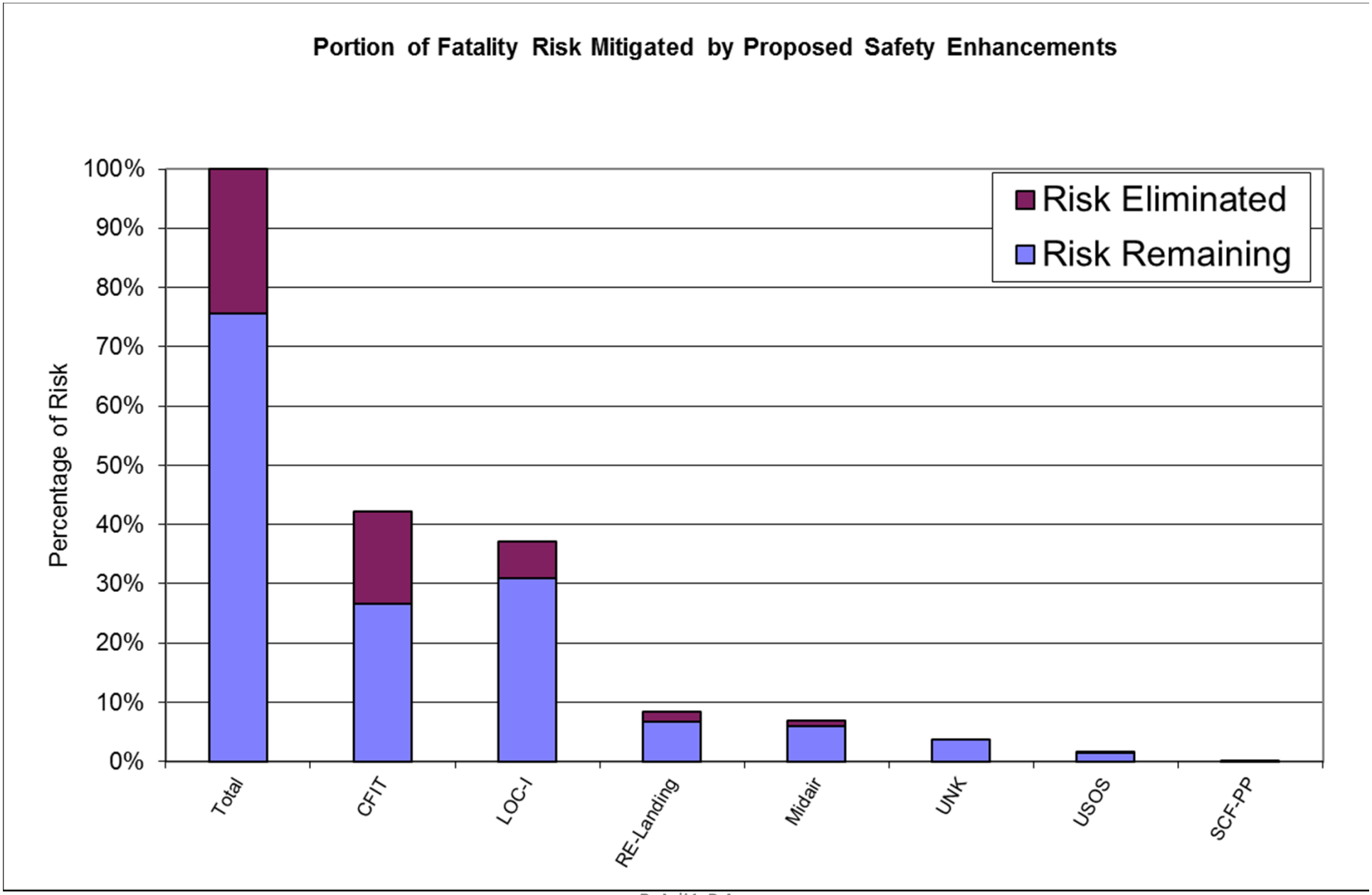
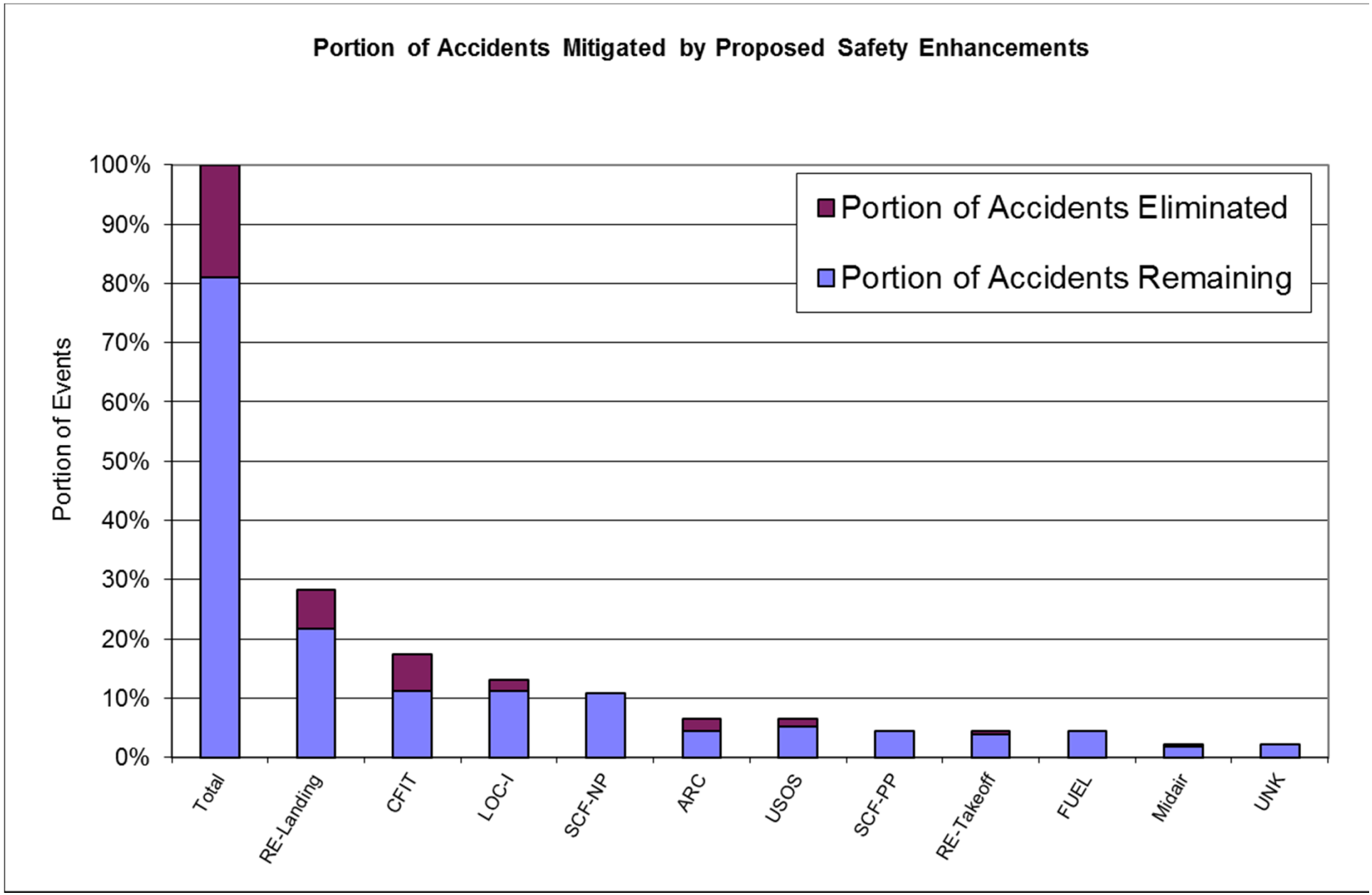
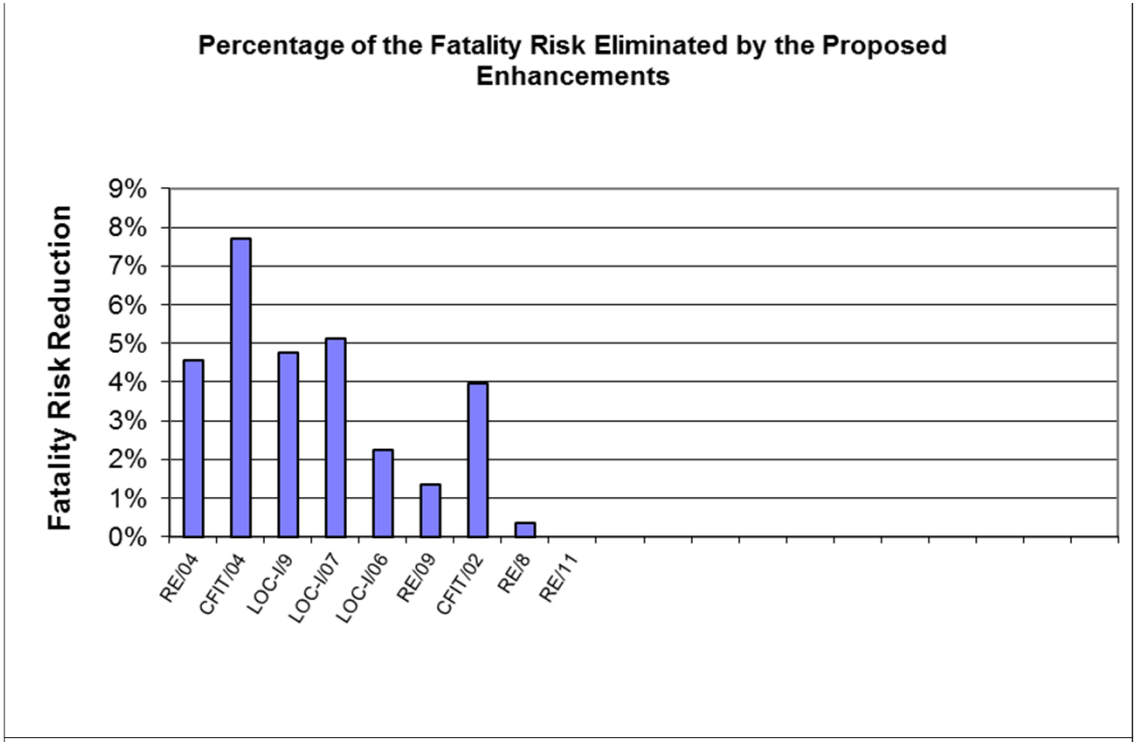
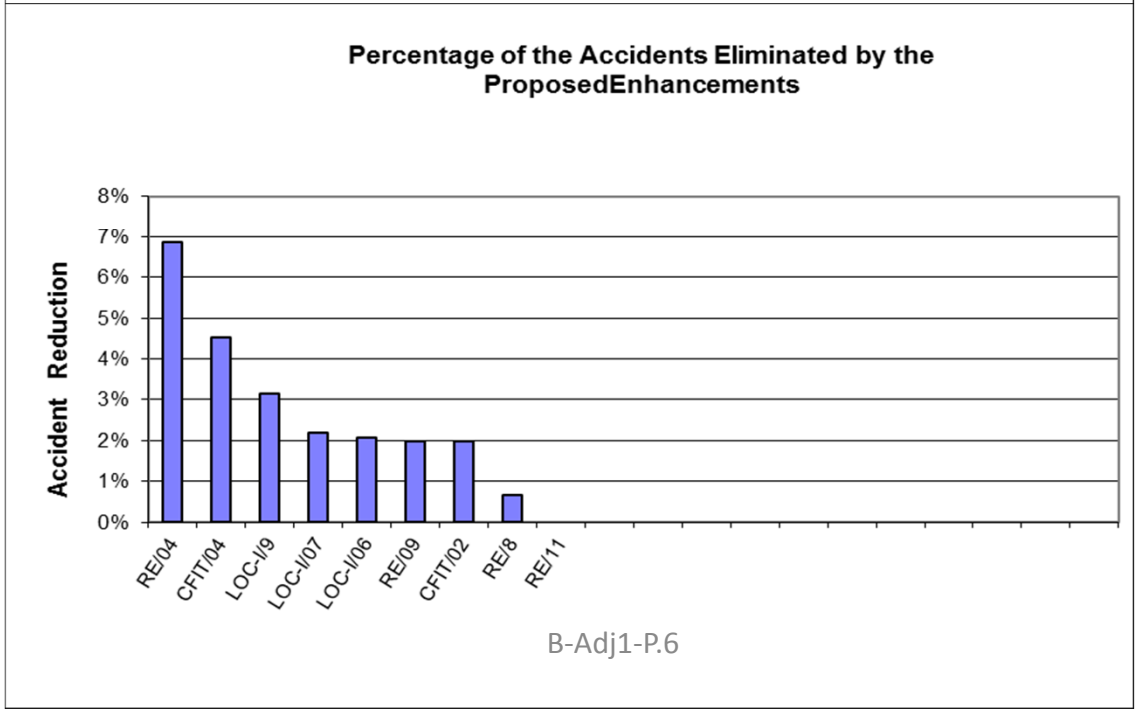
	Calculation/Output Field
	Summary Output


Portion of Fatality Risk Mitigated by Proposed Safety Enhancements
Percentage of Risk
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Risk Eliminated
Risk Remaining
Total
CFIT
LOC-I
RE-Landing
Midair
UNK
USOS
SCF-PP


Portion of Accidents Mitigated by Proposed Safety Enhancements
Portion of Events
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Portion of Accidents Eliminated
Portion of Accidents Remaining
Total
RE-Landing
CFIT
LOC-I
SCF-NP
ARC
USOS
SCF-PP
RE-Takeoff
FUEL
Midair
UNK

Assumes Each Safety Enhancement is Acting on Its Own





Unmitigated Fatality Risk From High to Low

Categor	Date	Airplane	Jet/Turbo Prop	Airline	Location	Remaining Severi
LOC-I	10/26/2003	Fairchild FH-227	TP-Large	CATA Linea Aerea SA	(near) Buenos Aires, AR	1.000
LOC-I	12/18/2003	DC-9	Jet	Lineas Aereas Surame	(near) Mitu, CO	1.000
CFIT	9/6/2011	SA-227BC Metro I	TP-Small	Aerocon	Trinidad, Bolivia	0.889
LOC-I	5/18/2011	SF34A (26)	TP-Large	SOL Líneas Aéreas	Prahuaniyeu, Argentina	0.878
MIDAIR	9/29/2006	B737 (NG)	Jet	GOL Linhas Aereas	(near) Peixote Azevedo, BR	0.855
LOC-I	9/14/2002	ATR 42	TP-Large	Total Linhas Aereas	(near) Paranapanema, BR	0.780
CFIT	8/30/2002	EMB-120 Brasilia	TP-Small	RICO Linhas Aereas	(near) Rio Branco, BR	0.767
RE-Landin	7/17/2007	Airbus A320	Jet	TAM Linhas Aereas	Sao Paulo, BR	0.752
CFIT	1/28/2002	B727-100	Jet	TAME	(near) Ipiales	0.580
CFIT	1/9/2003	Fokker F.28	Jet	TANS	(near) Chachapoyas, PE	0.538
UNK	5/14/2004	EMB-120	TP-Small	RICO Linhas Aereas	(near) Manaus, BR	0.524
LOC-I	8/16/2005	MD-80	Jet	West Caribbean Airway	(near) Machiques, VE	0.464
CFIT	11/18/2006	B727	Jet	Aerosucre Colombia	(near) Leticia, CO	0.459
CFIT	2/21/2008	ATR-42-300	TP-Large	Santa Barbara Airlines	(near) Merida, VE	0.425
LOC-I	9/13/2010	ATR-42-320	TP-Large	Conviasa	Puerto Ordaz, Venezuela	0.333
USOS	1/25/2010	Embraer 110C Ba	TP-Small	Piquiatuba Táxi Aéreo	near Senador José Porfirio, Bra	0.200
RE-Landin	11/18/2004	Jetstream 31	TP-Small	Venezolana	Caracas, VE	0.190
CFIT	8/23/2005	B737 (JT8D)	Jet	TANS	(near) Pucallpa, PE	0.178
RE-Landin	4/16/2006	Fokker F.27	TP-Large	TAM - Transporte Aere	Guayaramerin, BO	0.032
SCF-PP	7/23/2008	F.27-400	TP-Large	TAM - Transporte Aere	70nm from Guayaramerin, BO	0.028
USOS	8/16/2010	B737-73V (WL)	Jet	AIRES Colombia	San Andres, Colombia	0.010

	A	B	C	D	E	F	G	H
1					**DETAILED IMPLEMENTATION PLANS (DIPs) by PA-RAST/11**			
2	**#**	**DIP**	**Description**	**Champion**	**Output**	**Deadline**	**Status**	**Comments**
3	1	RE/04	Promote pilot adherence to Standard Operating Procedures (SOPs) for approach procedures including go-around decision making process	ALTA	1) Distribution	18/01/11	Completed	
4					2) Training		Completed	
5	2	RE/09	Specific Training for pilots and air traffic controllers to avoid unstabilized approaches	ALTA	1) ALTA will conduct a survey within its operators regarding the actions taken to mitigate unstable approaches.	20/02/11	Completed	
6								
7					2) Develop a strategy to deliver safety seminars for pilots and controllers in Pan America that targets recognition and avoidance of unstable approaches.	31/12/12	In process	Updated: 5 December 2012. ALTA, IFALPA, IFATCA currently working on the script and working on video budget funding.
8								
9	3	CFIT/02	Specific ALAR/CFIT Training for Pilots	IATA	1) CAA conducts a review of all operators to ascertain which operators have CFIT prevention training and procedures in their approval training	20/02/11	Completed	
10					2) If an operator does not have a CFIT training, it will be encourage to incorporate CFIT training into the airline training program.	20/12/11	Completed	
11	4	CFIT/04	CRM/Situational Awareness for pilots and air traffic controllers	IFALPA & IFATCA	1) Incorporate and/or update CRM/situational awareness training programs for all flight crew members of air transport operators emphasizing aircraft position with relation to terrain and reviewing past	20/02/12	In process	IFALPA is coordinating with IATA and IFATCA the development of a video for pilots and air traffic controllers regarding Crew Resource Management (CRM).
12								
13					2) Incorporate CRM/situational awareness training programs for all air traffic controllers and air navigation service providers (ANSP) emphasinzing aircraft position with relation to minimum allowable	20/08/12	In process	
14								
15	5	LOC-I/06	LOC Training – Human factors and automation	PA-RAST	1) Review and evaluate the advisory circular created by the ICAO COSCAP's in Asia	20/02/11	Completed	
16								
17					2) ICAO will distribute a copy of the developed generic advisory circular to each State in the region.	20/03/11	Completed	
18					3) Each State in the region wil use the generic advisory circular as a template to prepare a State Advisory Circular on mode awareness and energy state management aspects of flight deck automation.	20/09/11	Completed	
19								
20					4) Mode awareness and energy state management aspects of flight deck automation guidance is provided by operators to all their pilots.	20/09/12	Completed	
21	6	LOC-I/07	LOC Training – Advanced maneuvers	ALTA	1) Listing of training materials available from regulators, industry, operators, academia and other resources.	18/01/11	Completed	
22					2) Advanced Maneuvers Training provided to all operators.	18/04/11	Completed	
24					3) Advanced Maneuvers Training provided by all operators. The expectation is that this training will be accomplish during initial training and as part of the recurrent training program via ground and simulator instruction within the certified flight envelope, with enphasis on recognition, prevention and recovery technique.	18/08/13	Superseded	
25								
26	7	LOC-I/9	Loc Training - Pilot monitoring policies and procedure for the operator and training program for crews	IFALPA	1) Listing of training materials available from industry, operators and other resources.	20/02/11	Completed	
27					2) Raise awareness of availability and need of Pilot Monitoring Training.	20/03/11	Completed	
28					3) Pilot Monitoring Training material provided to all operators.	20/03/11	Completed	
29					4) Pilot Monitoring Training provided by operators to all their pilots.	20/09/12	Completed	
30	8	RE/8	Guidance in maintaining runway in accordance with Annex 14	ACI-LAC	1) Create a guide that collects best practices for runway maintenance	18/04/12	Completed	
32					2) Promote and encourage the use of the guide		In process	ESC requested ACI-LAC to provide enhanced Manual for approval and dissemination.
33					3) Airports implement their maintenance plans according to the runway maintenance guide.		In process	
34								
35					1) Gather and publish in the RASG-PA website available material that		Completed	

	A	B	C	D	E	F	G	H
36					may be used in to mitigate hazards related to runway safety.			
37								
38								
40					2) Electronic checklist development.		In process	Updated: 6 December 2012. Mexico DGAC is developing the Toolkit to be presented to the PA-RAST for approval. Considering that the electronic checklist will be part of the Toolkit they requested that Output 2 be removed from the DIP.
41	9	RE/11	Develop guidance material and training programs to create action plans for runway safety teams	DGAC Mexico	3) Establishment of a regional Runway Safety Database.	25/02/12	In process	Updated: 6 December 2012. Mexico DGAC considered that the Output 3 would not be feasible and request to be removed from the DIP.
43					4) Develop a roll out plan.	25/08/12	In process	Updated: 6 December 2012. Mexico DGAC considered that the Output 4 must be coordinated with PA-RAST due to the need of resurces for delivering the workshops.
44					X) Launch of the RST Toolkit			Updated: 6 December 2012. Mexico DGAC suggested to include the new Output X for launching the Toolkit
45					5) Review and update of the Runway Safety Teams.		In process	Updated: 6 December 2012. Mexico DGAC considered that the Output 5 is monitored by the ICAO NACC and SAM and RASG-PA, and the material is updated by ICAO HQ. Therefore, they requested to be removed from the DIP.

Rast No	Safety Enhancement Action	Reference	GSI	Safety Impact	Changeability	Indicator	Priority
RAST-PA/LOC-I/07	LOC Training – Advanced maneuvers	SE 31	9	High	Moderate	P2	1

Safety Enhancement Action (expanded):
Promote LOC Training – Advanced maneuvers
Pilots will be better trained to avoid and recover from excursions from normal flight and loss of control.

Statement of Work:
Advanced Maneuvers Training (AMT) focuses on training to prevent and recover from hazardous flight conditions outside of the normal flight envelope, such upsets, stalls, ground proximity and wind shear escape maneuvers, and inappropriate energy state management conditions. There has been a recent increase accidents where loss of control was a contributing factor.

The purpose of this project is to collect and provide advanced maneuver training material and to encourage operators to use these materials to implement a maneuver ground training and flight training using appropriate flight training equipment. Emphasis should be given to stall onset recognition and recovery, u attitudes, upset recoveries, effects of icing, energy awareness and management, and causal factors that can lead to loss of control

Champion Organization:
ALTA

Human Resource:
Airline Associations, Pilot Associations; Safety, Flight Operations, and Training managers, aircraft manufacturers, ICAO, flight simulation device manufacture centers, existing training aids, and new materials developed by manufacturers.

Financial Resource:
The total cost associated with this project would be determined by the number of crew personnel that need to be trained and the amount of training time re
This initiative is considered essential for flight safety, there would be no cost associated with the devel

Relation Current Aviation Community Initiative:
- Voluntary training currently being done – both ground and flight
- Wind shear training required since 1988
- Airplane Upset Recovery Training Aid
- Commercial training products becoming available

Performance Goal Indicators:
Goal 1: Develop and make available AMT material for operators approved training programs
Indicator: Availability of the AMT material within 8 months of SCA.

Goal 2: All operators incorporate AMT in their approved training programs.
Indicator: Operators incorporate AMT material within 36 months of SCA.

Goal 3: Reduce occurrence of LOC accidents.
Indicator: A measurable reduction of loss of control incidents and accidents related to excursion from normal flight.

Key Milestones:
The following milestones are based on the date of Steering Committee Approval (SCA) (months):
- Distribute currently available Training Aids ALTA SCA +8
- Track adoption of AMT ALTA SCA +8
- Track Implementation SCA+8 and on a yearly basis

Potential Blockers:
- Some special interests might discredit AMT simulator training
- Operators might ignore AMT materials
- Operators might not accept the potential cost of this training
- Operators may not recognize the safety enhancement benefits

DIP Notes:

Advanced Maneuvers Training (AMT) refers to training to prevent and recover from hazardous flight conditions outside of the normal flight envelope. Examp in-flight upsets, stalls, ground proximity and wind shear escape maneuvers, and inappropriate energy state management conditions. This safety enhancem and provides advanced maneuver training material and encourages operators to use these materials to implement advanced maneuver ground and flight tra appropriate flight training equipment. Emphasis should be given to stall onset recognition and recovery, unusual attitudes, upset recoveries, effects of icing, awareness and management, and causal factors that can lead to loss of control.

RAST-PA/LOC-I/07 Output 1

Description: Listing of training materials available from regulators, industry, operators, academia and other resources.

Resources:

Resource Notes: RAST-PA Secretariat (NACC office) will produce a comprehensive list, with input from all RAST-PA members.
All aircraft manufacturers should provide a list of available training materials and aids.
FAA Airplane Upset Recovery Training Aid: is available on its public web site.

Time Line: SCA+ 5 months

Actions: RAST-PA should distribute the Airplane Upset Recovery Training Aid to all appropriate regional stakeholders.

Target Completion Date:

RAST-PA/LOC-I/07 Output 2

Description: Advanced Maneuvers Training provided to all operators.

Resources: 10000

Resource Notes: Estimated distribution costs in USD.
ALTA, IATA

Time Line: Output 1 Complete + 3 months

Actions: ALTA should provide the training materials to each operator in the region. IATA should support ALTA's initiative. ALTA should report the level of commitment by operator's flight operations and training departments.

Target Completion Date:

RAST-PA/LOC-I/07 Output 3

Description: Advanced Maneuvers Training provided by all operators. The expectation is that this training will be accomplished during initial training and as part of the recurrer training program, via ground and simulator instruction within the certified flight envelope, with emphasis on recognition, prevention and recovery techniques.

Resources:

Resource Notes: Costs may vary from operator to operator and would need to consider;
1) Revising the training program for AMT.
2) Assessing the simulator time allotted on the initial and recurrent syllabuses to accommodate AMT.
3) It is estimated that AMT training would require 30 minutes or less of simulator time.

Time Line:	Output 2 Complete + 28 months
Actions:	ALTA and IATA should promote a high level of commitment to advanced maneuvers training (AMT) by operator flight operations and training departments. Advan maneuvers training will be conducted emphasizing energy state management and early recognition and recovery from flight outside the certified aircraft-operatin envelope.Flight conditions outside of the certified flight envelope include inflight upsets, stalls, ground proximity and wind shear escape maneuvers, and inapprop energy state management conditions. The training will be accomplished via ground and simulator instruction within the certified flight envelope, with emphasis o recognition, prevention and recovery techniques. The simulator instruction will be within the limitation of the training device being utilized.
Target Completion Date:	

Rast No	Safety Enhancement Action	Reference	GSI	Safety Impact	Changeability	Indicator	Priority
RAST-PA/LOC-I/09	LOC Training – Pilot monitoring policies and procedure for the operator and training program for crews.		9	High	Easy	P1	2

Safety Enhancement Action (expanded): Promote Pilot Monitoring Techniques and Training. Monitoring performance can be significantly improved by training these skills

Statement of Work: The purpose of this project is to collect and provide pilot monitoring training material and to encourage operators to use these materials to implement pilot r training and flight procedures.

Inadequate flight crew monitoring has been cited by a number of sources as a problem for aviation safety. A collaborative research effort by NASA-Ames, 21 airlines and the University of Texas Human Factors Research Program, which observed more than 2,000 airline flights, noted that roughly 62 percent of unint errors went undetected by flight crews. In addition, the Flight Safety Foundation, ALAR working group, has established that poor monitoring has been a factc percent of approach and landing accidents. ICAO has also determined that 50 percent of CFIT accidents had pilot monitoring as a common factor.

The term 'Pilot Monitoring' (PM) should be used as an alternative to 'Pilot Not Flying' (PNF) since it reflects clearly the most important function of a PNF.

Conventionally, when two pilots fly a fixed-wing airplane the aircraft commander occupies the left hand seat, and the co-pilot or first officer occupies the righ seat. Before the commencement of each flight leg, the aircraft commander decides which pilot will take direct responsibility for flying the aircraft and they b 'Pilot Flying' (PF) for that leg. The other pilot is then 'Pilot Not Flying' (PNF) and carries out supporting duties such as communications and check-list reading. some operators use alternative terms for PF and PNF.

Several major airlines have recently revised their procedures to maximize the monitoring of aircraft trajectory, automation and systems. They have tried to m eliminate concurrent procedures that conflict with crew monitoring.

Champion Organization: IFALPA

Human Resource: Pilot Associations, IATA, ALTA, ICAO, Flight Operations, and Training managers, training centers, existing training aids.

The total cost associated with this project would be determined by the number of flight crews that need to be trained and the amount of time required. This considered essential for flight safety.

Estimated 2 meetings of RAST representatives to implement Output 1.

Financial Resource:

Relation Current Aviation Community Initiative:
- Aligns with major findings by ICAO, FSF, NTSB.
- Aligns with components of CRM

Performance Goal Indicators:
Goal 1:Reduce occurrence of LOC accidents.
Indicator: A measurable reduction of loss of control incidents and accidents related to deviations from normal flight.

Goal 2: Pilot Monitoring Training material is readily available.
Indicator: Availability of the Pilot Monitoring Training material in each operator's organization within 2 months of Output 3.

Goal 3: All operators incorporate Pilot Monitoring Training in their approved training programs.
Indicator: Pilot Monitoring Training is provided to all transport airplane pilots. Within 18 months of Output 4.

Key Milestones: The following milestones are based on the date of Steering Committee Approval (SCA) (months):
- Distribute currently available Training Aids ALTA SCA+5
- Track adoption of Pilot Monitoring Training ALTA SCA+12

Potential Blockers:
- Operators might not accept the potential cost of this training
- Operators may not recognize the safety enhancement benefits

DIP Notes:

Pilot Monitoring policies and procedure for the operator and training program for crews.

RAST-PA/LOC-I/09 Output 1

Description: •Listing of training materials available from industry, operators, and other resources.

Resources:

Resource Notes: RASG-PA Secretariat (NACC office) will produce a comprehensive list.

Time Line: SCA + 5 months

Actions: RASG-PA should distribute the Pilot Monitoring Training Aid to all appropriate regional stakeholders (IATA, ALTA, CAA, etc.).

Target Completion Date:

RAST-PA/LOC-I/09 Output 2

Description: •Raise awareness of availability and need of Pilot Monitoring Training.

Resources:

Resource Notes: IFALPA, Local Pilot Associations

Time Line: Completion of Output 1 + 1 months

Actions: IFALPA, ALTA and local pilot associations should market and promote ongoing activities that develop a higher level of commitment to Pilot Monitoring Training by operator's flight operations, standards and training departments.

Target Completion Date:

RAST-PA/LOC-I/09 Output 3

Description: •Pilot Monitoring Training material provided to all operators.

Resources:

Resource Notes: ALTA, IATA, CAA's

Time Line: Completion of Output 1 + 2 months

Actions: ALTA should provide the training materials to each operator in the region. IATA should support ALTA's initiative. ALTA should report to RASG-PA the level of commitment by the operator's flight operations and training departments.

Target Completion Date:

RAST-PA/LOC-I/09 Output 4

Description:	•Pilot Monitoring Training provided by operators to all of their pilots.
Resources:	
Resource Notes:	Operator's flight operations, standards and training departments, pilot associations.
Time Line:	Completion of Output 3 + 18 months
Actions:	Each operator should carefully developed procedures and guidelines that support pilot monitoring in their training programs. Each transport airplane pilot should trained to the Pilot Monitoring procedures and guidelines developed by their organization.
Target Completion Date:	

GSI #	Description	Champion	Output	Deadline	Status	Comments
3	Protection of Safety Information	COCESNA				
12	Sharing of Information Safety Data	RASG-PA	ASIAS/RASG-PA data sharing			
		IATA/ALTA	IATA/ALTA Trend Sharing Program			
		DGAC CR	PASO			
		ANAC	BRAZIL			
4	Accident/Incident Regional Board	COCESNA				
	Business case for thechnology to mitigate runway excursions	ICAO LIM				
	Spanish Standard Phraseology	ALTA				Using PANS-ATM (DOC 4444) Chapter 12
	Bird Strike Risk Reduction Program	IATA/ALTA	PTY	Aug-13	To start Jun 2012	Biologist apointed, gathering pre-assessment requierements
			GYE	Aug-13	To start Jun 2012	

ESC Approved Detailed Implementation Plans (DIPs)

Rast No	Safety Enhancement Action	Reference	GSI	Safety Impact	Changeability	Indicator	Priority	Time Frame
RAST-PA/RE/04	Promote pilot adherence to Standard Operating Procedures (SOPs) for approach procedures including go- around decision making process.		9	High	Easy	P1	1	Short

Safety Enhancement Action (expanded):	Promoting pilot adherence to Standard Operating Procedures (SOPs) which would include stabilized approach criteria and go/no go take-off decision making procedures is key to preventing and reducing the risk of runway excursions. Reviewing existing operational policies, procedures and programs is also part of an overall strategy in mitigating runway excursion risk.
Statement of Work:	Runway Excursion has been identified as the highest safety risk area in Pan America. In order to proactively reduce this risk, RASG-PA chartered the Regional Aviation Safety Team (RAST) to review runway excursion information and develop mitigation strategies to reduce this risk.
Champion Organization:	ALTA
Human Resource:	ICAO (NACC, SAM, HQ), IATA, ALTA, ACSA, FSF, CANSO, aircraft manufacturers, ALPA, IFALPA, IFATCA, CAA's, and other stakeholders.
Financial Resource:	10000
Relation Current Aviation Community Initiative:	IATA Runway Excursion Risk Reduction toolkit/FSF: ALAR toolkit (version June 2010) Colegio de Pilotos Aviadores de México: Aeronautical Decision Management Training
Performance Goal Indicators:	Goal 1: target audience(s): Latin America and Caribbean, will value the information provided (1) Objective: educate the target audience(s) (2) Indicator: to reach 80% of the airlines pilots in the Region (3) Indicator: to reach 80% of other stakeholders as determined by the research. Goal 2: increase the awareness on runway excursions (1) Objective: reduce the number of events (2) Indicator: reduction of 80% of the events in the region
Key Milestones:	• Authorization by IATA to upload copyright material from RERR Toolkit in RASG-PA website: pending • Release of State letters from RASG-PA Secretariat recommending establishment of SOPs: SCA+02 • RAST – PA Report from metrics regarding RE/04: Upon completion of Output 2 +03
Potential Blockers:	a)Strategic Challenges i)Incorporate new audience in addition to airline's pilots ii)Distribution of training material to airlines iii)Distribution of training material to non-airline pilots iv)Establish and maintain communication with the Pan American pilots and other stakeholders v)Operators to include recommendations into their Manual of Operations vi)Operators to include recommendations into their training programmes vii)Get feedback viii)Metrics to determine penetration of this programme
DIP Notes:	**1. Research to determine the target audience(s) Determine the specific groups of pilots to be reached in order to achieve our objective Determine other stakeholders that would benefit.** **2. Communication and distribution options: Letter from RASG-PA Secretary to recommend that all operators establish SOP's that include stabilized approach criteria for pilots and a no fault go-around policy for unstable approaches, mentioning the FSF/IATA Runway Excursion Risk Reduction Tool Kit. Letter from RASG-PA Secretary to States recommending that all operators establish SOP's that include stabilized approach criteria for pilots and a no fault go-around policy for unstable approaches, mentioning the FSF/IATA Runway Excursion Risk Reduction Tool Kit.** **3. Press releases from ALTA, IATA, IFALPA. 4. RASG-PA website news release, uploading of training material and E-mails to target audience**

Keep in mind that there is no contradiction with the pressure for pilots in the subsequent flight analysis.

RAST-PA/RE/04 Output 1

Description:	Distribution
Resources:	
Resource Notes:	Cost of the material and distribution to the operators.
Time Line:	SCA+ 5 months
Actions:	1. RAST/RE recommends that all operators establish SOP's that include stabilized approach criteria for pilots and a no fault go-around policy for unstable approaches. 2. In coordination with FSF and IATA, RAST/RE should develop an awareness campaign to promote the adherence to SOP's for approach procedures including the go-around decision making process. The campaign will distribute the FSF/IATA Runway Excursion Risk Reduction Tool Kit, the Colegio de Pilotos Aviadores de Mexico Aeronautical Decision Management training, and any other available material. 3. Time to train trainers
Target Completion Date:	12

RAST-PA/RE/04 Output 2

Description:	Training
Resources:	
Resource Notes:	Variable costs depending on the operator.
Time Line:	SCA+ 15 months
Actions:	Operators to include material in training programs.
Target Completion Date:	

Rast No	Safety Enhancement Action	Reference	GSI	Safety Impact	Changeability	Indicator	Priority	Time Frame
RAST-PA/RE/08	Guidance in maintaining runway in accordance with Annex 14 (put this point next to 6)	Annex 14, Doc 9137 ICAO	1	High	Easy	P1	3	Short

Safety Enhancement Action (expanded): To reduce runway condition/maintenance related accidents and incidents at airports by following a runway maintenance guide in accordance with ICAO Annex 14.

Statement of Work: Establish a team who will compile and develop, if necessary, runway maintenance guidance for airports in the Panamerican region.

Champion Organization: ACI-LAC

Human Resource: CAAs, ICAO, ACI, IATA, ALACPA, Airport Operators, Maintenance staff and providers.

Financial Resource: To be determined, in-kind support to develop the guidance material.

Relation Current Aviation Community Initiative:
ACI Airside Safety Handbook
Annex 14
ICAO Doc 9137 Airport Services Manual Par 2 – Pavement Surface Conditions
ICAO Doc 9157 Part 4 Visual Aids
Runway excursion risk reduction toolkit

Performance Goal Indicators:
Goal 1: Create a guide that collects best practices for runway maintenance.
Indicator: Online availability of the guide.

Goal 2: Promote and encourage the use of the guide.
Indicator: RASG-PA promotion of the guide.

Goal 3: airports implement their maintenance plans according to this guide.
Indicator: A measurable amount of airports that incorporate the use of the guide into their action plans.

Goal 4: Reduce the occurrence of runway condition related incidents and accidents.
Indicator: A measurable and continued reduction in runway condition related incidents and accidents.

Key Milestones:

DIPESC X	Approval
Output 1 The guide	ESC X Date + 6
Output 2 Promote	Output 1 + 12
Output 3 Implementation of the guide	Output 1 + 18

Potential Blockers:
- Lack of resources to establish the plans correctly
- Differences between CAAs and airport operators
- Weaknesses in regulatory oversight
- Airport operators may not recognize safety enhancement benefits of implementing the plan according to the guidelines
- Data sharing

DIP Notes: RASG-PA, Annual Safety Report Team (ASRT), will review collected data on a yearly basis. This data will be reflected in the annual RASG-PA Safety Report

RAST-PA/RE/08 Output 1

Description: Create a guide that collects best practices for runway maintenance.

Resources:

Resource Notes: ACI

Time Line: 6 months

Actions: Establish a team who will compile and develop, if necessary, runway maintenance guidance for airports in the Pan American region. The team should be composed of at least; an ICAO Annex 14 expert, a representative from aerodromes and Aerodrome cognizant CAA representative. Once available the guidance should be translated into Spanish.

Target Completion Date:

RAST-PA/RE/08 Output 2

Description: Promote and encourage the use of the guide.

Resources:

Resource Notes: RASG-PA

Time Line: 12 months

Actions: Produce information material that may be disseminated at events throughout the Region. Call on RASG-PA Members to disseminate the information.

Target Completion Date:

RAST-PA/RE/08 Output 3

Description: Airports implement their maintenance plans according to the runway maintenance guide.

Resources:

Resource Notes: ACI, RST's

Time Line: 18 months

Actions: Use a data-driven approach to identify aerodromes that could benefit from improved runway maintenance. Encourage RST at Airports to use the runway maintenance guide and track outcomes through their action plans. Track aerodrome action plans to determine the number of aerodromes that are using the guide.

Target Completion Date:

Rast No	Safety Enhancement Action	Reference	GSI	Safety Impact	Changeability	Indicator	Priori
RAST-PA/RE/09	Specific Training for pilots and air traffic controllers to avoid unstabilized approaches		9	High	Easy	P1	2

Safety Enhancement Action (expanded): Develop safety seminars for pilot and air traffic controllers to mitigate the causes of unstable approaches in Pan America.

Statement of Work: Runway Excursion has been identified as one of the highest safety risk area in Pan America. In order to proactively reduce this risk, RAST in collaboration wi develop safety seminars for pilots and controllers that will provide specific training and tools to mitigate the causes of unstable approaches and related acti requiered.

Champion Organization: ALTA

Human Resource: IATA, ATA, ATAC, ACSA, ICAO, aircraft manufacturers, IFALPA, IFATCA, flight data analysis companies (Sagem, ADI, Airfase, etc.), organizations, CANSO, local traffic controller associations, flight academies, training centers and other stakeholders.

Financial Resource: Costs would be shared by the operators, manufacturers, pilot associations and governments.

Relation Current Aviation Community Initiative: - Runway Safety Action Teams (RSAT); local equivalent collaborative teams in Pan America.

Performance Goal Indicators:
Goal: reduce occurrence of runway excursion accidents.
Indicator: a measurable reduction of runway excursion incidents and accidents.

Key Milestones:
The following milestones are based on the date of SCA approval (months):
- Survey & Reports SCA + 6
- Seminars Output 1 + 24

Potential Blockers:
- Insufficient funds to conduct seminars
- Inadequate implementation of recommendations from outputs
- Participation from industry
- Human resources, specialists, facilitators
- Language barriers
- Obtaining copyright approval for available training material
- Political barriers
- Data sharing restrictions
- Time availability

DIP Notes:
Impact on Aviation Safety in the Region:
This project would have a positive impact on aviation by avoiding accidents and incidents related to runway excursion.

RAST-PA/RE/09 Output 1

Description: ALTA will conduct a survey within its operators regarding the actions taken to mitigate unstable approaches.

Resources:

Resource Notes: ALTA members

Time Line: SCA + 6 months

Actions: The information obtained will be presented and be used to prepare the content for the safety seminars.
The goal will be to identify needs and share best practices to improve training methods.

Target Completion Date:

RAST-PA/RE/09 Output 2

Description: Develop a strategy to deliver safety seminars for pilots and controllers in Pan America that targets recognition and avoidance of unstable approaches.

Resources:

Resource Notes: Stakeholders as listed above

Time Line: Output 1 + 24 months

Actions: Develop a strategy and timeline to deliver safety seminars for pilots and controllers.

At a minimum the following topics should be covered:
- Stabilized Approaches
- Go Around Gates and Missed Approach Criteria
- Approach Procedures and Briefings
- Non Normal Aircraft Conditions
- Transfer of Aircraft Control
- CRM/TRM and human factors
- Weather conditions and information dissemination including tail wind landings

During the safety seminars participant will be asked to provide additional mitigation measures that will be compiled and used as the basis of future safety enhance for runway exercusions.

Target Completion Date:

Rast No	Safety Enhancement Action	Reference	GSI	Safety Impact	Changeability	Indicator	Priority
RAST-PA/RE/11	Develop guidance material and training programs to create action plans for runway safety teams.	Annex 14, ICAO Doc. 9137, IATA, FAA, IFALPA Airport Liaison Program	9	High	Easy	P1	1

Safety Enhancement Action (expanded): To reduce runway related accidents and incidents at airports by identifying airport specific hazards and developing mitigations.

Statement of Work: Establish the framework to create Runway Safety Teams (RST) which will evaluate airports for hazards and implement the appropriate mitigations. Facilitate of data, training material, mitigations, and workshops.

Champion Organization: Mexico

Human Resource: CAAs, ICAO, Airport Operators, Air Operators, Air Traffic Management/Communication Navigation Surveillance providers, Fixed Base Operators, Pilots.

Financial Resource: Database creation, workshops, RASG-PA resources for material compilation.

Relation Current Aviation Community Initiative: ICAO Global and Regional Runway Safety Initiative, Flight Safety Foundation Runway Safety Initiative, Commercial Aviation Safety Team Safety Enhancement

Material currently available:

- ICAO (http://www2.icao.int/en/RunwaySafety/Pages/Toolkits.aspx)
- Flight Safety Foundation (http://flightsafety.org/current-safety-initiatives/runway-safety-initiative-rsi)
- Federal Aviation Administration (http://www.faa.gov/airports/runway_safety/resources/lrsat/)
- EUROCONTROL (http://www.eurocontrol.int/runwaysafety/public/standard_page/keyActions.html)
- IFALPA (http://ifalpa.org/ifalpa-training/alr/alr.html)

Performance Goal Indicators:

Goal 1: Establish a runway safety team (RST) at the busiest airport of each contracting State in the Pan American region in terms of operations per year.
Indicator: Twelve teams established per year.

Goal 2: Establish a RST at all international airports of each contracting State in the Pan American region.
Indicator: Twelve teams established per year.

Goal 3: Reduce the occurrence of runway related incidents and accidents.
Indicator: A measurable reduction in runway related incidents and accidents.

Key Milestones:

DIP	ESC X Approval
Output 1 Gather & Publish information	ESC 10 Date + 3
Output 2 Checklist	Output 1 + 6
Output 3 Database	Output 1 + 6
Output 4 Roll out plan	Output 3 + 6
Output 5 Review and update	Output 4 + 6

Potential Blockers:

- Lack of resources to establish RSTs
- Differences between CAAs and airport operators
- Airport operators may not recognize safety enhancement benefits
- Data sharing
- Lack of resources to implement mitigations

DIP Notes: RASG-PA, Annual Safety Report Team (ASRT), will review collected data on a yearly basis. This data will be reflected in the annual RASG-PA Safety Report.

Multidisciplinary runway safety teams are envisaged to work with airport operators to identify areas of opportunity and available resources to enhance runw for specific aerodromes.

RAST-PA/RE/11 Output 1

Description:	Gather and publish in the RASG-PA website available material that may be used to mitigate hazards related to runway safety.
Resources:	
Resource Notes:	ICAO
Time Line:	6 months
Actions:	Publish or make links available to websites such as FSF, CAST, FAA, EURCONTROL and IFALPA which RST may use to proposed mitigation actions for identified haz related to runway safety.
Target Completion Date:	

RAST-PA/RE/11 Output 2

Description:	Electronic checklist development
Resources:	
Resource Notes:	ICAO, IFATCA, IATA & ACI
Time Line:	6 months
Actions:	Develop an electronic checklist based on best practices and threat and error management that RST may use to identify hazards and propose mitigation actions. T checklists should address the following areas: - ATM/CNS - Air operators - Airport - Before releasing final versions of the checklists, field test in a pilot project - Translate Checklists into Spanish
Target Completion Date:	

RAST-PA/RE/11 Output 3

Description:	Establishment of a regional Runway Safety Database
Resources:	
Resource Notes:	ICAO
Time Line:	6 months
Actions:	Create a Regional database that will house the data from the checklists (Output 2) with at least the following considerations: - Option to de-identify the source of the information - Where possible responses should be selectable (rather than free text) - Contain appropriate level(s) of data entry - Consider the legal aspects of data sharing - Capture the resulting mitigation actions and their end result

- Capture the resulting mitigation actions and their end result
- Before releasing final versions of the checklists/database interface, field test in a pilot project
- Spanish version

Target Completion Date:

RAST-PA/RE/11 Output 4

Description: Develop a roll out plan

Resources:

Resource Notes: RAST-PA / FSTT-PA

Time Line: 6 months

Actions: Organize workshops in Pan America to disseminate the information and train on:
- Establishment of RST
- The use of the DB
- The use of the checklist
- Finding Material related to runway safety.

Target Completion Date:

RAST-PA/RE/11 Output 5

Description: Review and Update of the Runway Safety Teams

Resources:

Resource Notes: RAST-PA

Time Line: 6 months

Actions: Develop a process to review on a two times a year basis the number of RSTs established and ensure that all relevant runway safety material is maintained update

Target Completion Date:

Rast No	Safety Enhancement Action	Reference	GSI	Safety Impact	Changeability	Indicator	Priority	Time Frame
RAST-PA/CFIT/02	Specific ALAR/CFIT Training for Pilots	SE-12, ALAR Toolkit, FSF CFIT Training	9	Medium	Moderate	P5	1	Short

Safety Enhancement Action (expanded): Promote specific ALAR/CFIT prevention training and procedures to be included in operators approved training curriculums, emphasizing pilot situational awareness and escape procedures for flight crews to use in the event of a terrain warning indication.

Statement of Work: Controlled Flight Into Terrain (CFIT) has been identified as one of the top three data driven risk areas in Pan-America. CFIT is a significant cause of commercial aviation equipment loss and fatalities, worldwide. CFIT accidents could be substantially reduced if all operators and training centers in Pan America developed CFIT prevention procedures and add them to their approved initial and recurrent training curriculums.

Champion Organization: IATA

Human Resource: CAA's, ICAO, IATA, ATA, ALTA and industry partners.

Financial Resource:

Relation Current Aviation Community Initiative:
- RASG-PA has identified CFIT as the number two flight safety risk area in Pan America.
- Flight Safety Foundation (FSF) has recently updated (April 2010) the ALAR Toolkit that includes CFIT Education and Training.

Performance Goal Indicators:

Goal 1: A reduction of 80% in ten years of CFIT accidents involving operators in Pan America.
Indicator: Operator CFIT accident rate in Pan America is continuously reduced toward the goal.

Goal 2: CFIT training and guidance material will be provided to all operators and training centers not conducting CFIT training.
Indicator: All operators and training centers are conducting CFIT training.

Goal 3: Post CFIT Education and Training Guidance Material on the RASG-PA Website. Indicator: CFIT training material posted on the RASG-PA Website prior to completion of Output 1.

Key Milestones:
- CAA's conduct a review of all operators CFIT training programs SCA + 6 months
- CFIT Education and Training Guidance Material Available on the Web. SCA + 2 months
- Operators and training centers will incorporate CFIT training into their training programs. SCA + 12 months

Potential Blockers:
- Availability of CAA resources.
- Operators may not recognize the safety enhancement benefits

DIP Notes:

RAST-PA/CFIT/02 Output 1

Description: CAA's conduct a review of all operators to ascertain which operators have CFIT prevention training and procedures in their approved training programs.

Resources:

Resource Notes: CAA (Flight Safety Oversight Department)
Estimate of 2 to 4 CAA man-hours per airline to complete operator review
CAA Inspector review checklist

Time Line: SCA+ 6 months

Actions: Through the flight safety oversight departments, CAA's will direct inspectors to conduct a review of their operator and identify which operators provide CFIT prevention training and procedures within their approved training programs.

Target Completion Date:

RAST-PA/CFIT/02 Output 2

Description:	If an operator does not have CFIT training, he will be encouraged to incorporate CFIT training into the airline training program.
Resources:	
Resource Notes:	Operators, CAA's and ICAO Variable cost depending on the operator and the number of pilots
Time Line:	SCA+ 16 months
Actions:	Operators will incorporate CFIT prevention training and procedures into their training programs.
Target Completion Date:	

Rast No	Safety Enhancement Action	Reference	GSI	Safety Impact	Changeability	Indicator	Priority	Time Frame
RAST-PA/CFIT/04	CRM/Situational Awareness for pilots and air traffic controllers (To include review of actual events when possible)	SE -11, SE-46, SE-47	12	Medium	Moderate	P5	2	Medium

Safety Enhancement Action (expanded): Include specific CRM/situational awareness training and procedures to all pilots and air traffic controller training curriculums, emphasizing pilot and controller situational awareness with respect to CFIT.

Statement of Work: Crew Resource Management/Controller Resource Management (CRM) training, situational awareness and CFIT prevention are closely linked. This project will reduce CFIT accidents by promoting comprehensive pilot and air traffic controller CRM training programs.

Champion Organization: IFALPA/IFATCA

Human Resource: CAA's, ICAO, ANSP's, IFALPA, IFATCA, IATA and industry partners.

Financial Resource:

Relation Current Aviation Community Initiative:
- RASG-PA website (http://www.mexico.icao.int/RASGPA.html#TrainingRefs)
- FSF virtual library (http://flightsafety.org/)
- ALAR Briefing Note – Crew Resource Management (http://flightsafety.org/files/alar_bn2-2-crm.pdf)
- Airbus (http://www.airbus.com/en/corporate/ethics/safety_lib/)
- Boeing operators (www.myboeing.com)

Performance Goal Indicators:

Goal 1: A substantial reduction of CFIT accidents involving air transport operators in Pan America.
Indicator: Operator CFIT accident rate in Pan America decreases by 80%.

Goal 2: CRM/situational awareness training and guidance material provided to all air transport operators and Air Traffic Personnel.
Indicator: Increase in number of operators and Air Traffic Personnel that are conducting CRM/situational awareness training.

Goal 3: Post the CRM/situational awareness guidance material on the RASG-PA Website.
Indicator: CRM/situational awareness guidance material posted on the RASG-PA Website by the time of SCA +2 months.

Key Milestones:
- CRM/situational awareness training and guidance material available on the Web. SCA +2 months
- Operators will incorporate CFIT training into their training program. SCA +18 months
- ANSP will incorporate CFIT training into their training program. SCA+ 24 months

Potential Blockers:
- Availability of CAA/ANSP/State resources.
- Operators, States and ANSP may not recognize the safety benefits

DIP Notes: All communications to States should be conducted through the RASG-PA Secretariat. Guidance on coordinating with ICAO and identifying which operators and ANSPs are providing CFIT prevention training and procedures within their approved training programs may be useful to States.

ATC training in this area has already been developed

RAST-PA/CFIT/04 Output 1

Description: Incorporate and/or update CRM/situational awareness training programs for all flight crew members of air transport operators emphasizing aircraft position with relation to terrain and reviewing past occurrences.

Resources:

Resource Notes: Air transport operators (training departments),
Variable cost depending on the operation

Time Line: SCA+ 18 months

Actions: Reduce the CFIT accident rate by incorporating CFIT prevention in CRM training programs. Situational awareness will be emphasized as an integral part of the CRM

Actions:	Reduce the CFIT accident rate by incorporating CFIT prevention in CRM training programs. Situational awareness will be emphasized as an integral part of the CRM training required of flight crewmembers of all air transport operators.
Target Completion Date:	

RAST-PA/CFIT/04 Output 2

Description:	Incorporate CRM/situational awareness training programs for all air traffic controllers of air navigation service providers (ANSP) emphasizing aircraft position with relation to minimum allowable altitudes.
Resources:	
Resource Notes:	ANSP's (training departments), CRM/situational awareness guidance material posted on the RASG-PA Website Variable cost depending on the ANSP
Time Line:	SCA+ 24 months
Actions:	Reduce the CFIT accident rate by incorporating CFIT prevention in CRM training programs. Situational awareness will be emphasized as an integral part of the CRM training required of air traffic controllers of all ANSPs.
Target Completion Date:	

Rast No	Safety Enhancement Action	Reference	GSI	Safety Impact	Changeability	Indicator	Priority	Time Frame
RAST-PA/LOC-I/06	LOC Training – Human factors and automation	SE 30	9	**High**	Moderate	P2	3	**Short**

Safety Enhancement Action (expanded):
To improve the overall performance of flight crews to recognize and prevent loss of control accidents, through effective use of automation.

Statement of Work:
To reduce loss of control accidents, operators will be encouraged to adopt consensus policies and procedures relating to mode awareness and energy state management aspects of flight deck automation, as appropriate to their respective operations.

Champion Organization:
RASG-PA (RAST-PA)

Human Resource:
IATA, Pilot Associations; Safety, Flight Operations and Training managers; ICAO, CAA's, aircraft manufacturers, training centers.

Financial Resource:
The total estimated cost would be X person-years.

Relation Current Aviation Community Initiative:
The following are some of the activities related to this project:

•Incident data has shown that flight deck automation is a core issue that needs to be addressed. To enhance safety, a CAST working group, including aircraft manufactures, pilot associations, etc. developed a tactical approach and distributed policies and procedures relating to mode awareness and energy state management. The COSCAP's in Asia used this material to develop a generic advisory circular.

•CAST Flight Deck Automation Working Group has been formed to recommend and prioritize actions to address, for current and projected operational use, the safety and efficiency of modern flight deck systems for flight path management (including energy state management).

•The Human Factors and Pilot Training Group of the ALPA, Air Safety Structure has identified its position regarding CRM and Human Factors with respect to the use of automation.

•SAE G10, Aerospace Behavioral Engineering Technology (ABET) Committee, deals with the philosophies, principles and criteria by which designers, engineers, pilots and behavioral scientists structure systems to achieve maximum human workload compatibility for automation efficiency. The committee has several subcommittees with on-going work into human factors and automation

Performance Goal Indicators:
Goal 1: Mitigate the effects of mode confusion and energy state management as contributing factors in loss of control accidents.
Indicator: A measurable reduction of loss of control incidents and accidents related to automation.

Goal 2: Mode awareness and energy state management aspects of flight deck automation advisory circular is readily available.
Indicator: Each ICAO contracting State in the region has issued an advisory circular and distributed it to each operator's in the State. Completion of Output 3.

Goal 3: All operators incorporate mode awareness and energy state management aspects of flight deck automation guidance in their approved training programs.
Indicator: Mode awareness and energy state management aspects of flight deck automation guidance is provided to all transport airplane pilots Completion of Output 4.

Key Milestones:
The following milestones are based on the date of Steering Committee Approval (SCA) (months):
•Review Asian advisory circular IATA SCA+6
•Issue generic advisory circular ICAO Output 1 +1
•Issuance of advisory circular by States in the Region. CAAs Output 2 +6
•Operators develop guidance based on the AC and train pilots. Operators Output 3 + 18
•Track Implementation RASG-PA SCA +12 and yearly

Potential Blockers:

- Operator might not embrace advisory circular material,
- Operators might not accept the potential cost of this training,
- Operators may not recognize the safety enhancement benefits,
- States may opt not to adopt and issue the advisory circular.

DIP Notes:

To reduce loss of control accidents, air carriers will be encouraged to adopt consensus policies and procedures relating to mode awareness and energy state management, as appropriate to their respective operations.

RAST-PA/LOC-I/06 Output 1

Description: Review and evaluate the advisory circular created by the ICAO COSCAP's in Asia

- ALTA / IFALPA / IATA team to review and evaluate the advisory circular created by the ICAO COSCAP's in Asia related to mode awareness and energy state management of flight deck automation.
- Based on this review create a generic advisory circular for the Region

Resources:

Resource Notes: ALTA, IFALPA, IATA, Pilot Associations, Flight Operations, Safety and Training managers, and Aircraft Manufacturers. The estimated cost of a one day meeting of the appropriate persons.

Time Line: SCA + 6 months

Actions: ALTA / IFALPA / IATA will convene a team to analyze the advisory circular, to verify policies and procedures related to mode awareness and energy state management are appropriate for the Region. The team will develop a generic mode awareness and energy state management aspects of flight deck automation advisory circular for Pan America.

Target Completion Date:

RAST-PA/LOC-I/06 Output 2

Description:

- ICAO will distribute a copy of the developed generic advisory circular to each State in the Region.

Resources:

Resource Notes: ICAO

Time Line: Completion of Output 1 + 1 months

Actions: ICAO Regional Offices will prepare a cover letter and disseminate the generic advisory circular to each member State in the Region.

Target Completion Date:

RAST-PA/LOC-I/06 Output 3

Description:

- Each State in the region will use the generic advisory circular as a template to prepare a State advisory circular on mode awareness and energy state management aspects of flight deck automation.

Resources:

Resource Notes: State regulatory authorities

Time Line: Completion of output 2 + 9 months

Actions: States in the Region to issue their own advisory circular on mode awareness and energy state management aspects of flight deck automation.

Target Completion Date:

RAST-PA/LOC-I/06 Output 4

Description:	Mode awareness and energy state management aspects of flight deck automation guidance is provided by operators to all of their pilots.
Resources:	
Resource Notes:	Operator's flight operations, standards and training departments.
Time Line:	Completion of Output 3 + 18 months
Actions:	Each operator should carefully developed procedures and guidelines that support the proper use of mode awareness and energy state management aspects of flight deck automation in their training programs. Each transport airplane pilot should be trained to the flight deck automation procedures and guidelines developed by their organization.
Target Completion Date:	

APÉNDICE C

EXCURSIONES DE PISTA

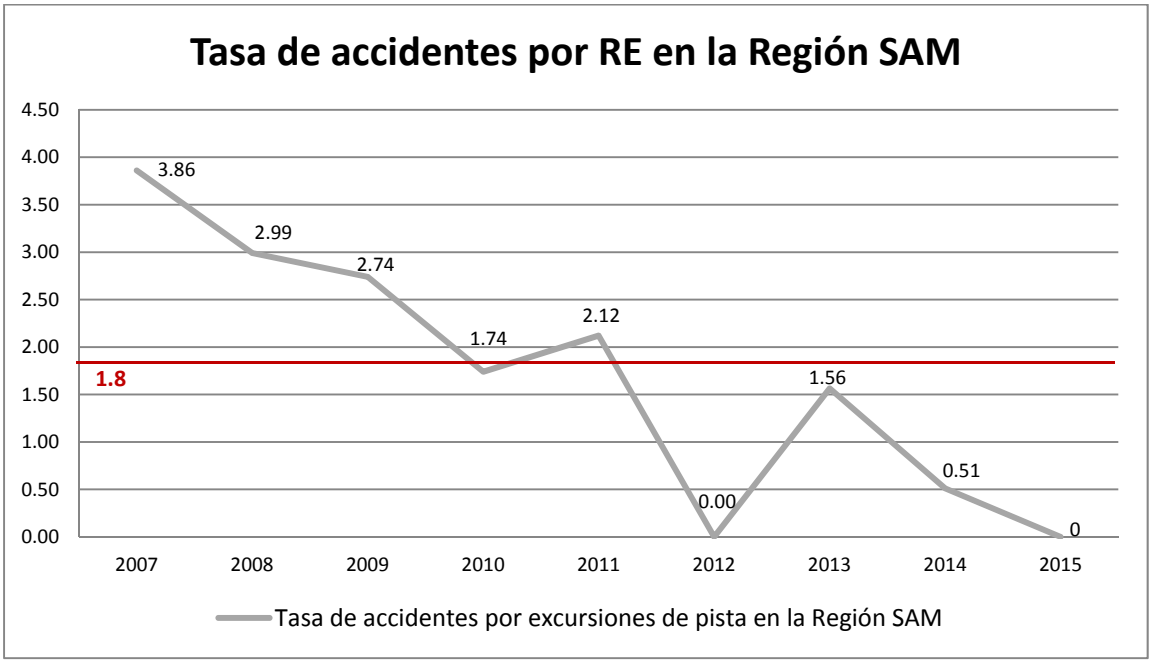
1. Indicadores de rendimiento de seguridad operacional

1.1 La meta para excursiones de pista fue establecida en la Declaración de Bogotá de la siguiente manera: *Reducir la tasa de excursiones de pista en un 20% con relación a la tasa promedio de la Región SAM (2007-2012).*

1.2 Con los datos presentados en la Tabla C-1 – Tasa de accidentes por excursiones de pista en la Región SAM, se pudo calcular la tasa promedio de **2.24** accidentes por millón de salidas durante el período 2007-2012.

1.3 La proyección de los accidentes por excursiones de pista muestra una disminución gradual de estos accidentes, excepto en 2011 y 2013 en que hay un pequeño incremento en la tasa. También se puede notar que en los años 2013 (1.56), 2014 (0.51) y hasta el 31 de agosto de 2015 (0), la tasa de accidentes se mantuvo por debajo de la meta calculada de **1.8** que se obtiene al r*educir la tasa de excursiones de pista en un 20% con relación a la tasa promedio de la Región SAM (2007-2012)* que es de **2.24 [**2.24 – 0.44 (20% de 2.24) = 1.8].

Tabla C-1 – Tasa de accidentes por excursiones de pista en la Región SAM



2. Meta de rendimiento de seguridad operacional

2.1 Para el período 2017-2019 se propone la siguiente meta: Reducir la tasa de excursiones de pista en 50% por debajo de la tasa promedio de la Región SAM del período 2011-2015.

3. Propuestas de mejoras de seguridad operacional para reducir los accidentes por excursiones de pista

2.1 Se propone las siguientes mejoras de seguridad operacional para reducir la tasa de accidentes por excursiones de pista:

- ✓ Período 2017-2019
  - ➢ Implantación del conjunto de material didáctico (tool kit) sobre seguridad operacional en la pista de la OACI.
  - ➢ Implantación eficaz de los equipos de seguridad operacional de pista (RST) en los aeródromos internacionales.
  - ➢ Implantación eficaz del programa de análisis de datos de vuelo (FDAP) en explotadores de transporte aéreo comercial que tengan aviones con un peso superior a 27 000 kg.
  - ➢ Implantación eficaz del programa de cualificación avanzada (AQP) o de la instrucción basada en la evidencia (EBT) de OACI (escenarios de aproximaciones no estabilizadas), según corresponda.
  - ➢ Implantación eficaz de un sistema de supervisión avanzado para la vigilancia de los procesos reactivos, proactivos y predictivos destinados al tratamiento de los peligros relacionados con excursiones de pistas.
  - ➢ Implantación de sistemas para la prevención de salidas de pista en los aviones de los explotadores de servicios aéreos comerciales.