Implementing SMS

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Emirates Airlines, Group Safety - Manager Safety Management System

Scope

- Safety & SMS
- SMS Components
- Some Implementation Challenges & Suggestions

Safety:

"The state in which risks associated with aviation activities, related to, or in direct support of the operation of aircraft, are reduced and controlled to an acceptable level."

ICAO Annex 19 - Definitions

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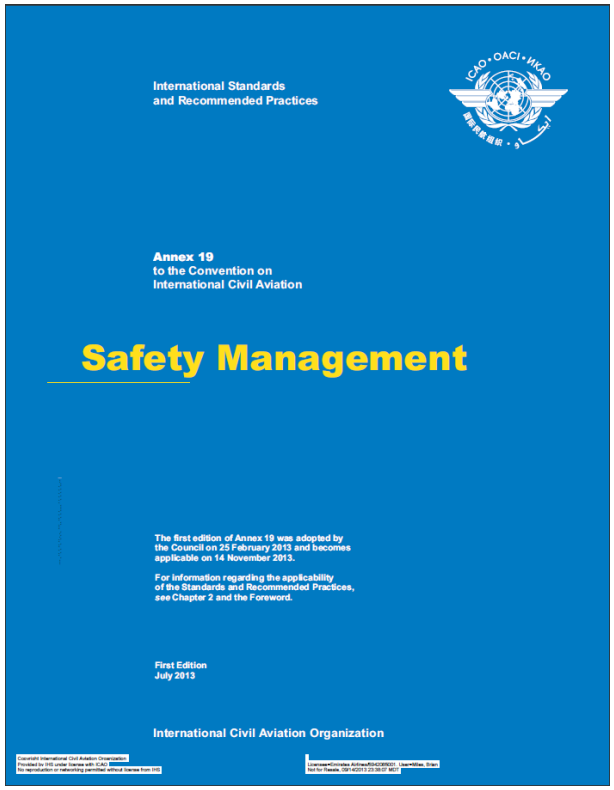
ICAO Annex 19 - Definitions

Safety Management System (SMS)

"*A Safety Management System (SMS) provides a systematic approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures*."



ICAO Annex 19 - Definitions

SMS - Safety Engagement

People & Human Factors

Safety Reporting

Safety Action Groups

SPIs / SPTs

Safety Boards

Management Review

Components of an SMS

Safety Policy

Safety Assurance

Safety Risk Management

Safety Promotion

Safety Policy

International

National

Company

Emergency Response Planning (ERP)

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Incident Support Unit

Emergency Response Procedures

GROUP SAFETY (GS)

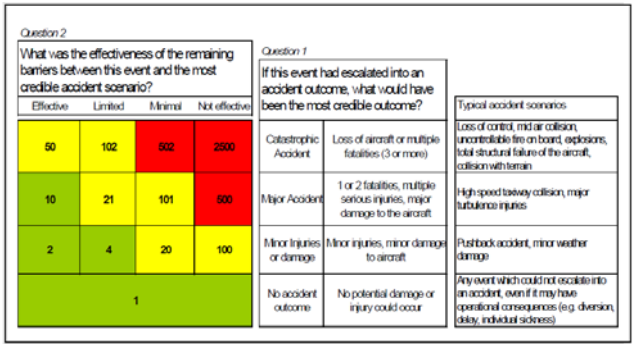
Safety Policy

Some of the Implementation Challenges

- Visibility of safety policy and delivery.
- Explanation of terminology e.g. ‘non-punitive’ & link to and application of ‘just culture’.
- Integration of Occupational / Workplace Health & Safety.
- Emergency response plans visibility & exercises.

Safety Risk Management

Choice of Safety Risk Management Tool(s)



Question 2

What was the effectiveness of the remaining barriers between this event and the most credible accident scenario?

Effective	Limited	Minimal	Not effective
50	102	502	2500
10	21	101	500
2	4	20	100
1			

Question 1

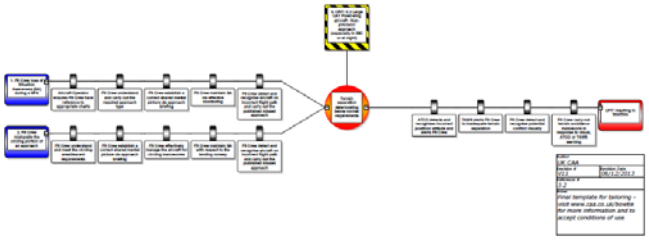
If this event had escalated into an accident outcome, what would have been the most credible outcome?

		Typical accident scenarios
Catastrophic Accident	Loss of aircraft or multiple fatalities (3 or more)	Loss of control, mid air collision, uncontrollable fire on board, explosions, total structural failure of the aircraft, collision with terrain
Major Accident	1 or 2 fatalities, multiple serious injuries, major damage to the aircraft	High speed taxiway collision, major turbulence injuries
Minor Injuries or damage	Minor injuries, minor damage to aircraft	Pushback accident, minor weather damage
No accident outcome	No potential damage or injury could occur	Any event which could not escalate into an accident, even if it may have operational consequences (e.g. diversion, delay, individual sickness)

Safety Risk Assessment Matrix

Risk Severity		Risk Probability: Extremely Improbable 1	Extremely Remote 2	Remote 3	Reasonably Probable 4	Frequent 5
Catastrophic	A	1A Review	2A Review	3A Unacceptable	4A Unacceptable	5A Unacceptable
Hazardous	B	1B Review	2B Review	3B Review	4B Unacceptable	5B Unacceptable
Major	C	1C Acceptable	2C Review	3C Review	4C Review	5C Unacceptable
Minor	D	1D Acceptable	2D Acceptable	3D Review	4D Review	5D Review
Negligible	E	1E Acceptable	2E Acceptable	3E Acceptable	4E Acceptable	5E Acceptable

Note: Number / Letter code indicates **Risk Index.** Colour indicates **Risk Index Category.**



Safety Events: e.g. ‘ARMS’ a ‘proactive’ risk assessment

Safety Risk Assessments

Safety Risk Management

Safety Risk Register(s)

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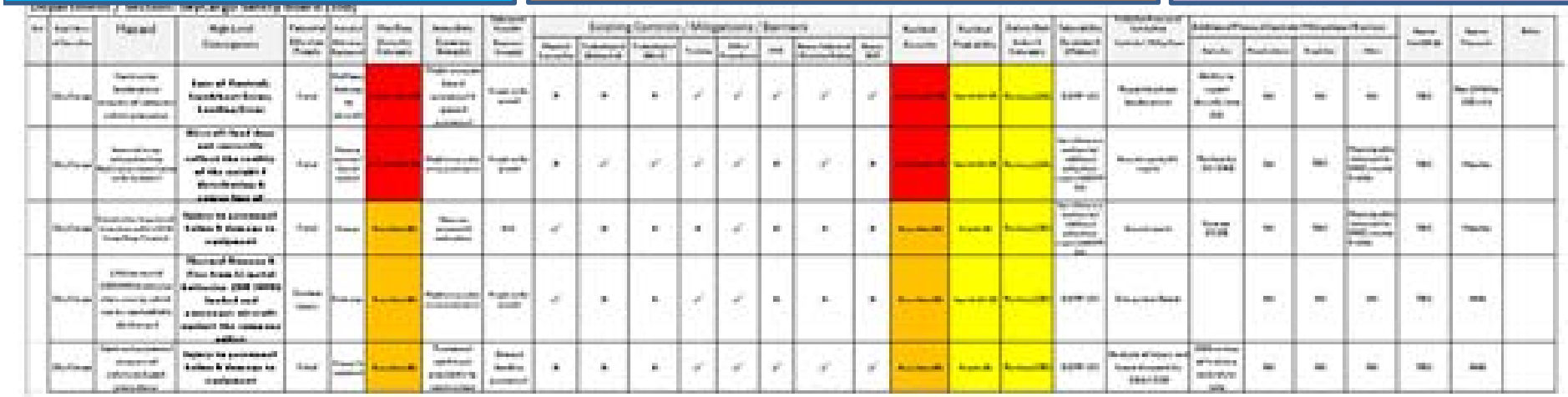
Hazards & Consequence

Barrier Analysis & Tolerability Decision

Future Developments



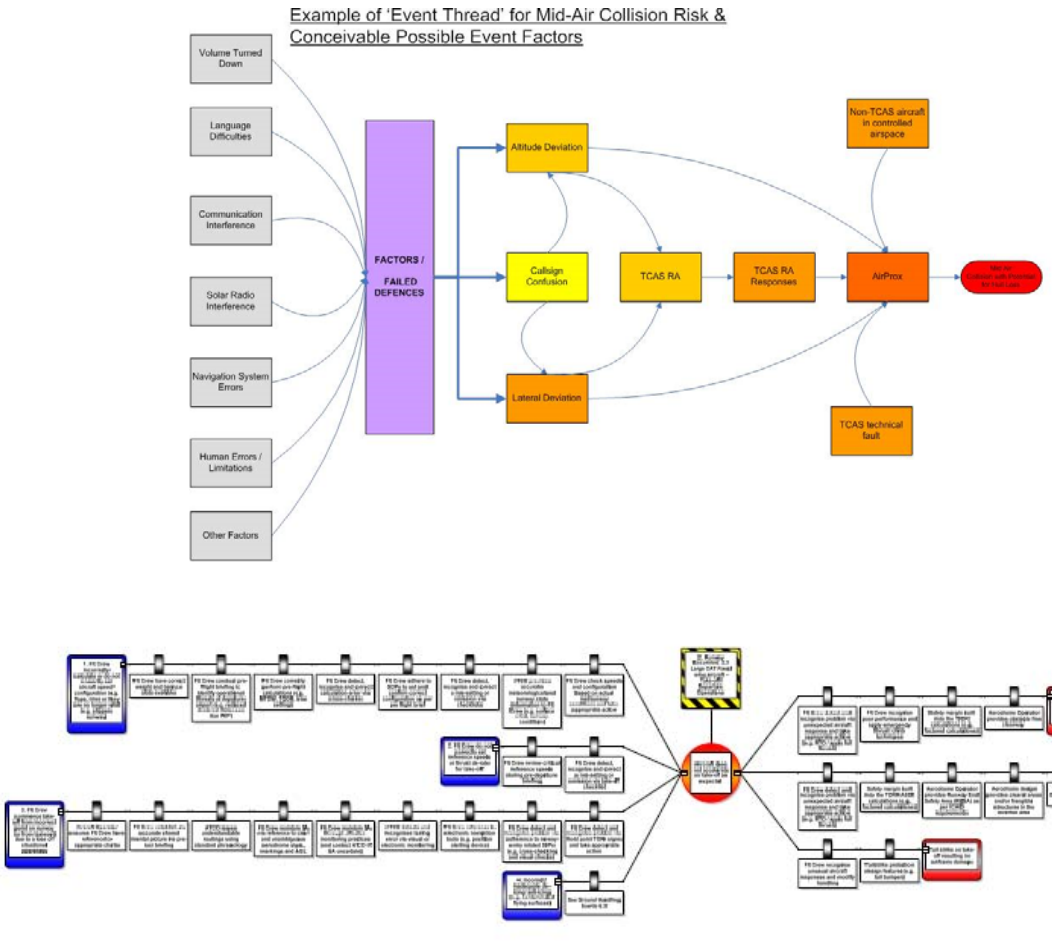
Safety Risk Management

Some of the Implementation Challenges

- Consistent definitions e.g. severity & probability.
- Understand any variations with other organizations.
- Barrier analysis: dependencies & effectiveness.
- How to present risk information to senior management.
- Who decides the acceptable level of risk (tolerability) and how.
- Validation of Safety Risk Controls – how is this to be done e.g. FODM; audits & links to SPIs/SPTs.

Safety Assurance

SPIs & SPTs



- Loss of Control
- Runway Overrun / Excursion
- CFIT
- Runway Incursion / Ground Collision
- Airborne Conflict
- Ground Handling
- Fire

Considerations for Setting SPIs/SPTs

What

- Should be measured?
- Are the definitions of the terms used?
- Are the estimates of data/reporting trends?
- Targets may be justifiable to set?

How

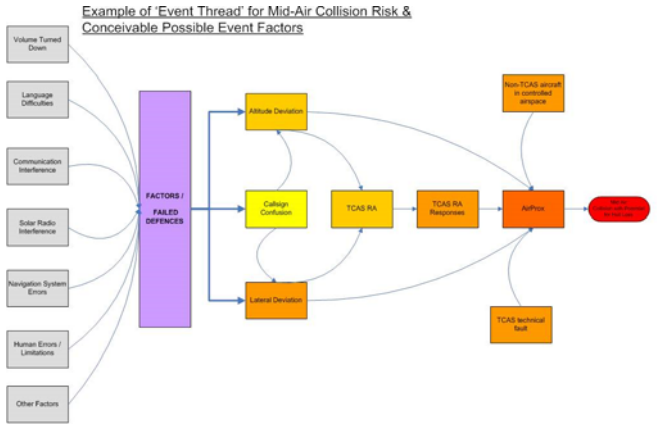
- Should the data be combined and sourced?
- Should information be base-lined?
- Should a target be specified?

Where

- Will the information come from? (ASR, FDM, ATC, etc.)
- Should the data be combined and sourced?

Why

- Is there safety justification/ benefit?



Example of SPI / SPT Format

SPI	Title of SPI e.g. EGPWS 'Pull Up'; Turbulence Injury
Area of Safety Concern	E.g. CFIT; turbulence injuries
Safety Aim / Objective	Example – Zero instances of CFIT; risk to be as low as reasonably possible
Definition	International definition if possible otherwise document definition
Information Source(s) & Expected Reliability for Source	Where will be data come from? E.g. Air Safety Reports; Audits; Flight Data Monitoring
Data Source(s) for SPI	Data source for SPI e.g. SDCPS
Reporting Period	E.g. Weekly / Monthly / Annual
Data Display Criteria	E.g. Count; Rate by 1000 sectors; flight hours etc
Alert Level	E.g. 75% of SPT level; 1 standard deviation of 12 month rolling average
SPT	What (if any) SPTs to set – data collection; zero; reduction of 5% on previous year
Safety Action Plan	Outline of Safety Action Plan

Safety Assurance

Some of the Implementation Challenges

- **SPIs** – phased, risk based approach.
- **SPIs** - clear definitions (ideally internationally agreed), if not possible then knowledge of any differences of definitions e.g. deep landings.
- **SPIs** – influences on SPIs: internal / external / both (e.g. TCAS RA) – integration of Human Factors.
- **SPIs** – communication: International – State / Regulatory – Operator/Service Provider & link to SSPs
- **SPTs** – what to set: not yet; zero; reduction.
- **Safety Action Plans** – who does what; link to any external organizations e.g. ATC, regulators; link to validation of Safety Risk Controls.

Safety Promotion

Safety Training & Education

Safety Communication

Safety Promotion

Safety Training & Education: Levels & Content

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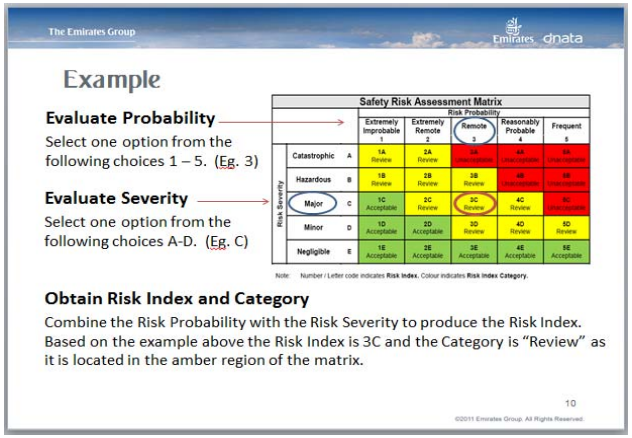
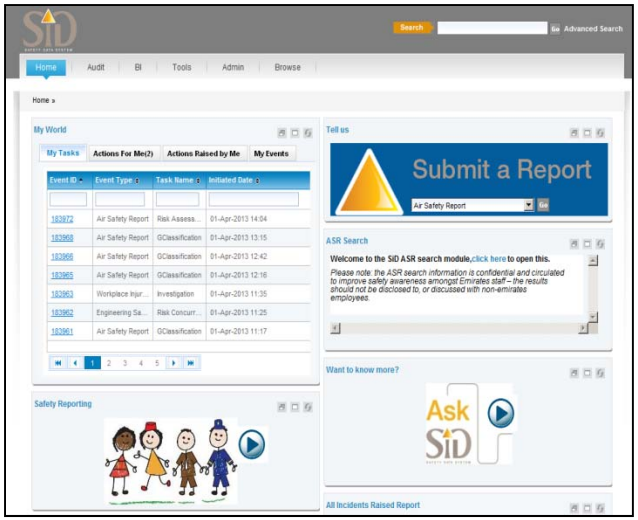
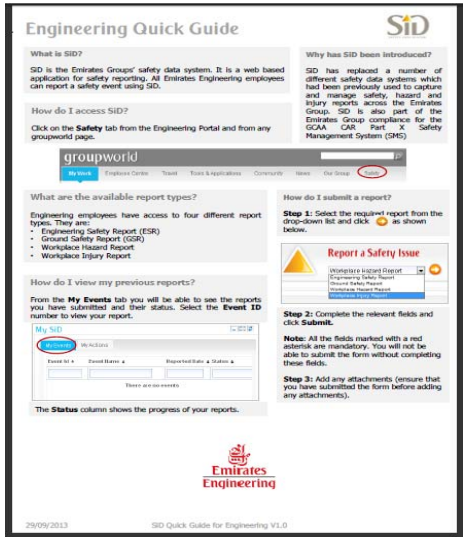
- Accountable Manager
- Senior Manager
- Manager / Supervisors
- Individual

Safety Promotion

Safety Training & Education

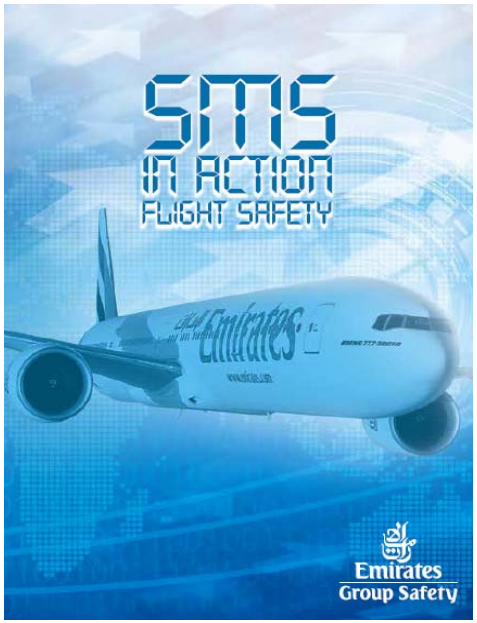






Safety Promotion

Safety Communication



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Safety Communication

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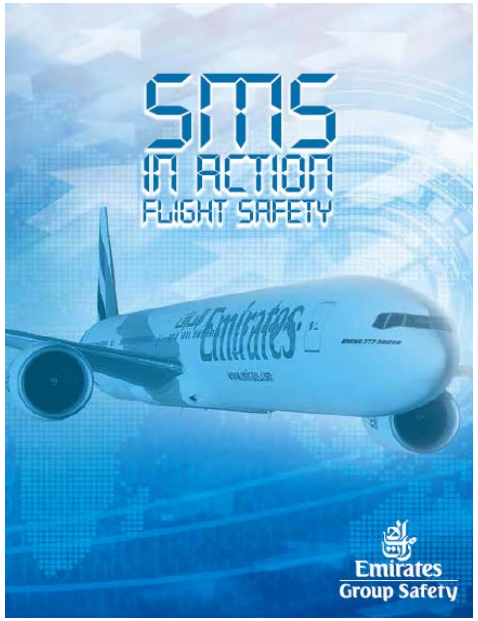

Safety Promotion

Some of the Implementation Challenges

- **Training** – define level(s) of training
- **Training** – content; language; recurrence
- **Communication** – varied methods appropriate to topic & audience
- **Communication** – partnerships & local empowerment

Summary

Safety Policy

Safety Risk Management

Safety Assurance

Safety Promotion

Thank You