



Implementation of SMS at Changi Airport

Lyndon Lee

Aerodrome Safety Unit

Changi Airport Group



Singapore Changi Airport



"I'VE JUST REMEMBERED! WE CAME HERE TO CATCH A FLIGHT"

The International Federation of Air Line Pilots' Associations



Deficiency-free since 1981

Singapore Changi Airport

- Aerodrome location indicator: WSSS
- Aerodrome reference code: 4F
- Passenger & cargo hub
- About 350,000 aircraft movements
- > 55 million passengers
- 2 parallel runways
- Category 10 fire protection on each runway
- Precision approach runways, Category II



Singapore Seletar Airport



- **Aerodrome location indicator: WSSL**
- **Aerodrome reference code: 3C**
- **Business & general aviation**
- **Maintenance, Repair & Overhaul hub**
- **About 50,000 aircraft movements**
- **Single runway**
- **Category 7 fire protection**
- **Non-instrument approach runway**

Singapore Changi Airport

1981 - 2009



From 1 July 2009



- Regulates the civil aviation industry in Singapore
- Provides air navigation services



- Focuses on:**
- Airport operations and management
 - Airport rescue & fire fighting service
 - Air hub development & commercial activities



- Invests in and manages foreign airports**

Changi Airport SMS Implementation Journey

Before 2009

- Introduction of SMS



After 2009

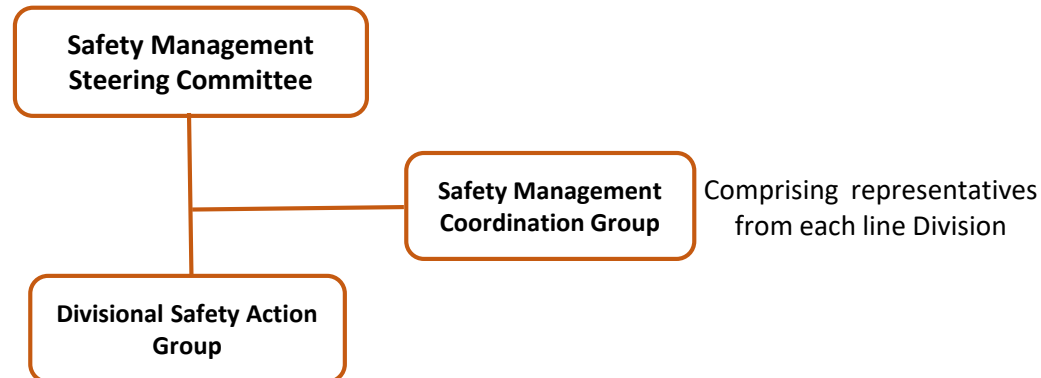
- SMS for new aerodrome operator organisation



Changi Airport SMS Implementation Journey

Before 2009

- Civil Aviation Authority of Singapore (CAAS) had 2 roles, one was to regulate the aviation industry, another was to operate and manage the two aerodromes
- SMS introduced in 2005, after aerodrome certification
- Steering Committee, comprising key operational Divisions



- Developed two SMS Manuals for the organisation – one for each aerodrome, with risk assessment processes, safety performance indicators, etc

Changi Airport SMS Implementation Journey

Before 2009



- Consolidation of Divisions' processes
- Early SMS outreach in the organisation
- No safety manager or safety office

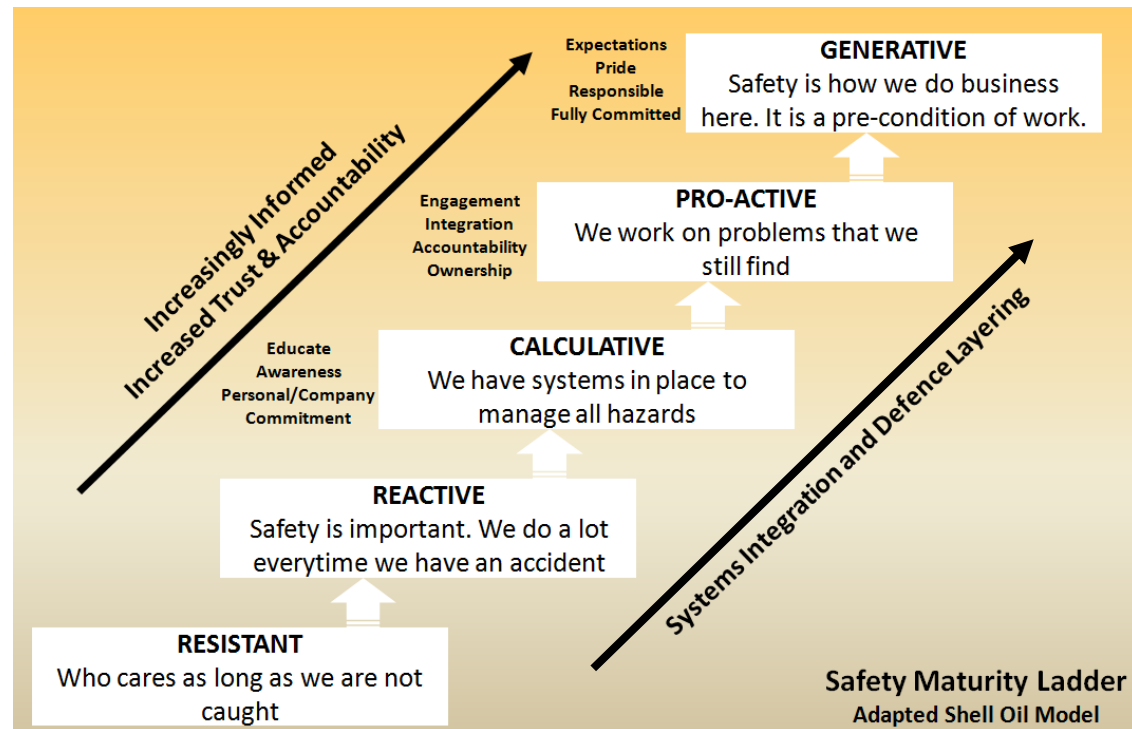


Changi Airport SMS Implementation Journey

After 2009



- SMS reviewed for new aerodrome operator organisation
- One SMS Manual for the organisation
- Dedicated safety office. Safety Manager appointed
- SMS outreach to all in the organisation
- Still evolving. Objective is towards a generative safety culture



Changi Airport SMS Implementation Journey

After 2009



- Mission Statement

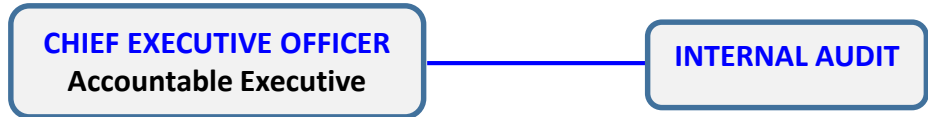
*To be the world's leading airport company,
growing a safe, secure and vibrant air-hub
in Singapore and enhancing the communities
we serve worldwide*

Changi Airport SMS Implementation Journey

After 2009



Aerodrome Operator Organisation



AIRPORT MANAGEMENT

- Airport airside/landside operations
- Aircraft rescue and fire fighting service
- Information technology
- Aviation security
- Aerodrome safety

ENGINEERING & DEVELOPMENT

- Airport master planning & design
- Airport development projects
- Maintenance of airport infrastructure & engineering systems

DEVELOPMENT (CHANGI EAST & TERMINAL 4)

- Changi East airfield planning, design & construction
- Changi East operations planning
- Terminal 5 Planning
- Terminal 4 programme management

CORPORATE

- Corporate & marketing communications
- Corporate strategy & business development
- Design management
- Economic affairs
- Enterprise risk management
- Legal

PEOPLE TEAM

- People services
- People rewards & systems
- People development
- People experience

AIR HUB DEVELOPMENT

- Air hub strategy
- Airline development
- Cargo & Logistics development
- Passenger development

FINANCE

- Corporate finance & Treasury
- Financial accounting & reporting
- Financial planning & Analysis

COMMERCIAL

- Airside concessions
- Landside concessions
- Pricing & commercial strategy
- Rentable properties
- Terminal 1 expansion

Changi Airport SMS Implementation Journey

After 2009



- Multi-tiered & inclusive safety committee structure



Changi Airport SMS Implementation Journey

After 2009



Coordination of Emergency Response Planning



Changi Airport SMS Implementation Journey

After 2009



Confidential Hazard Reporting Programme for Airport Community



244

DID YOU NOTICE the rectangular convex mirror installed near Aircraft Stand A3?

It is designed to provide drivers with a wider and clearer view of incoming traffic, especially when approaching blind spots and sharp bends. We are constantly looking for means to enhance roadway safety at the airport. If you find this useful or have any other suggestion to improve airside roadway safety, please do share with us.

Where you can find the feedback box...

1. Outside CAG Airside Operations Office
2. Joint IBAEC Office @ D38
3. SATS Ramp Office @ C13
4. SATS APIS Office @ F30
5. draba Ramp Office @ D40
6. draba Agent Office @ E28

HAZARD REPORTING

Open reporting is a habit we want to cultivate because it helps us identify potential dangers and mitigate them. It is not punitive and contributor's details are kept confidential. Report hazards and offer your suggestions as well as to make our airside and landside a safer place to be.

File a hazard report to:
www.changiportgroup.com
 via e-services -> Hazard Reporting

Email a hazard report to:
changisafety@changairport.com

Your contributions are important! Help us identify hazards in the airport and make a difference to reverse Changi's numbers.

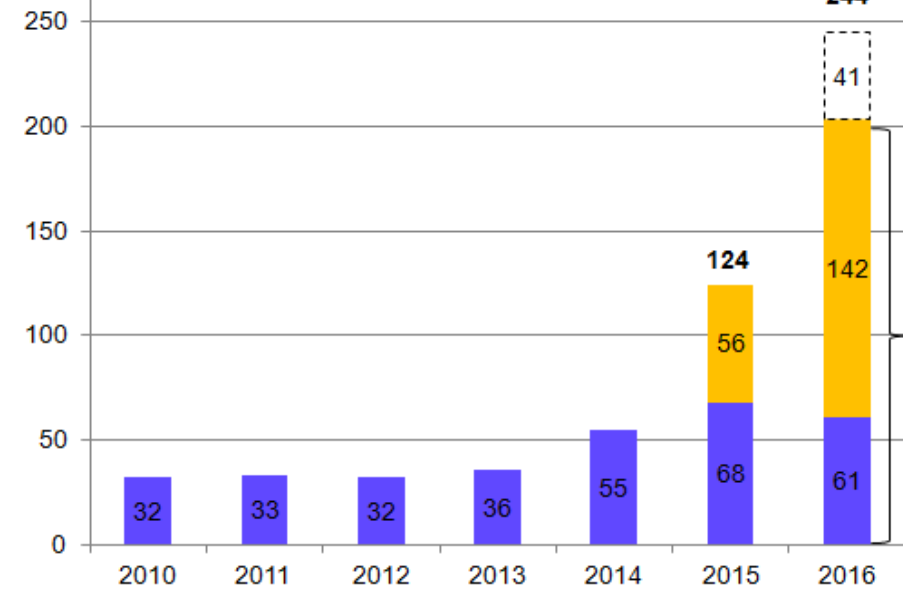
For hazards requiring immediate attention, call 6541 2424

STAY TUNED

TARGET ZERO CAMPAIGN IN APRIL 2014

PARTNERS in Aviation Safety

DID YOU KNOW



Full Year Projection

Mobile Application

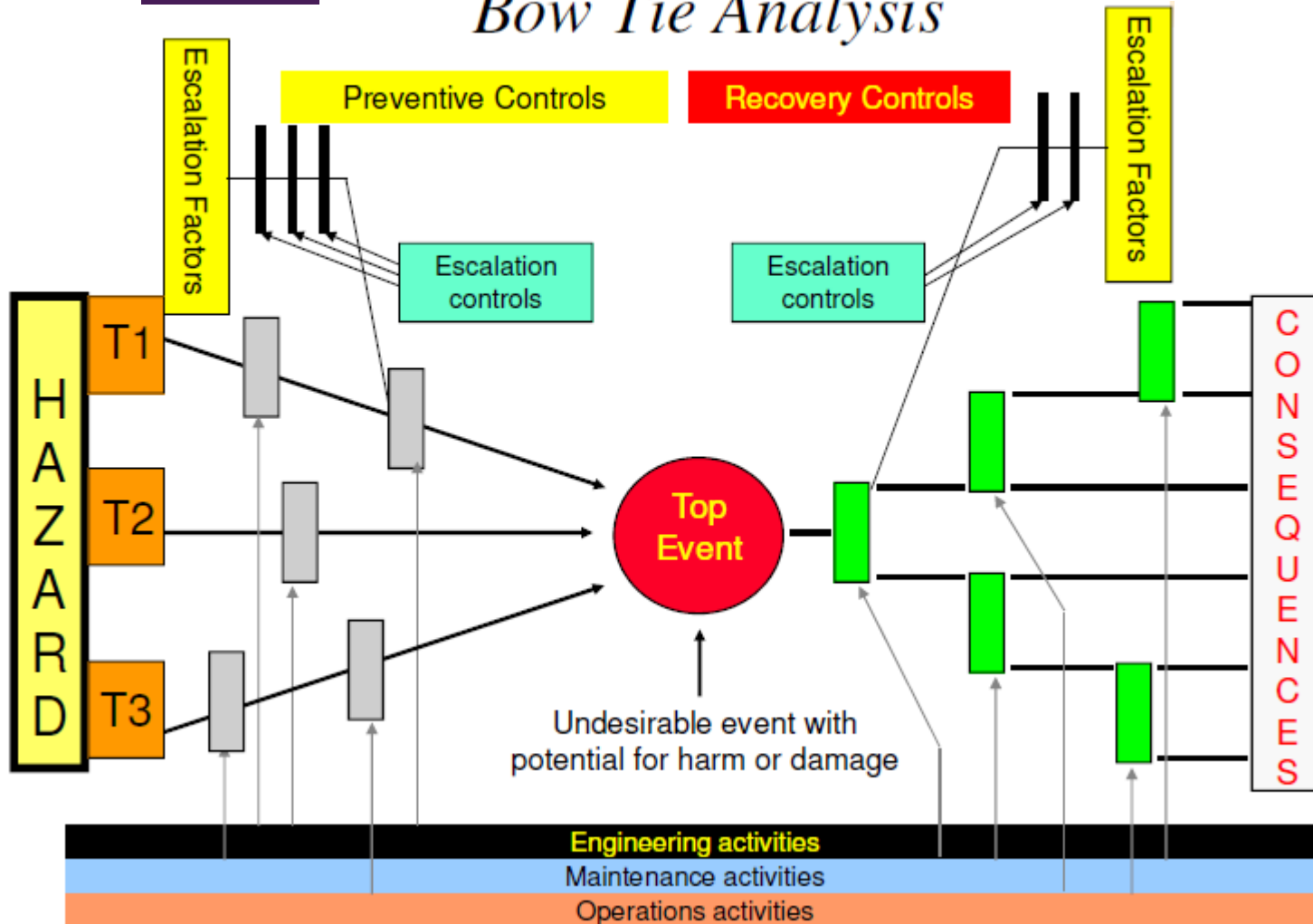
Internet & E-mail

Changi Airport SMS Implementation Journey

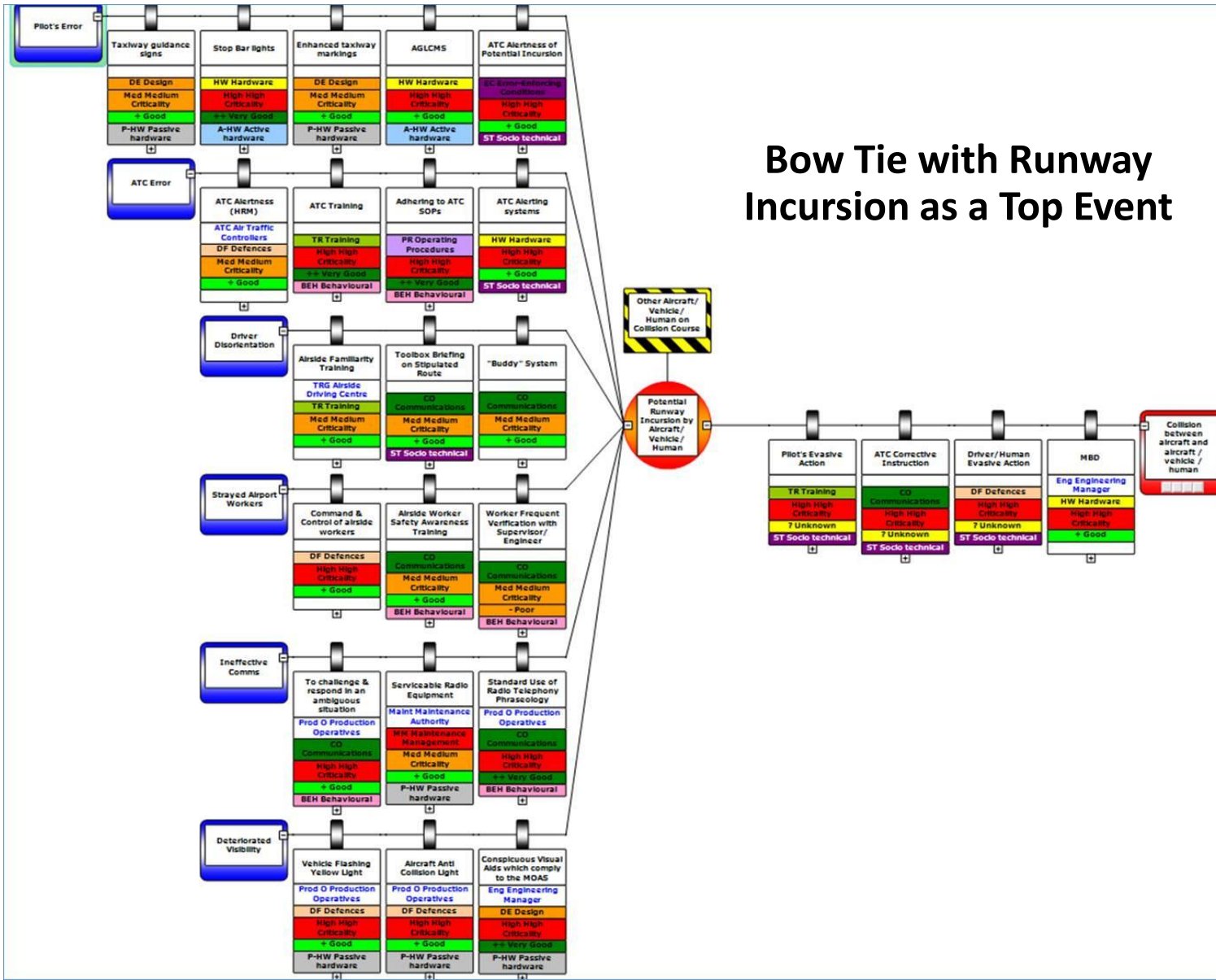
After 2009



Bow Tie Analysis



Changi Airport SMS Implementation Journey



Changi Airport SMS Implementation Journey

After 2009



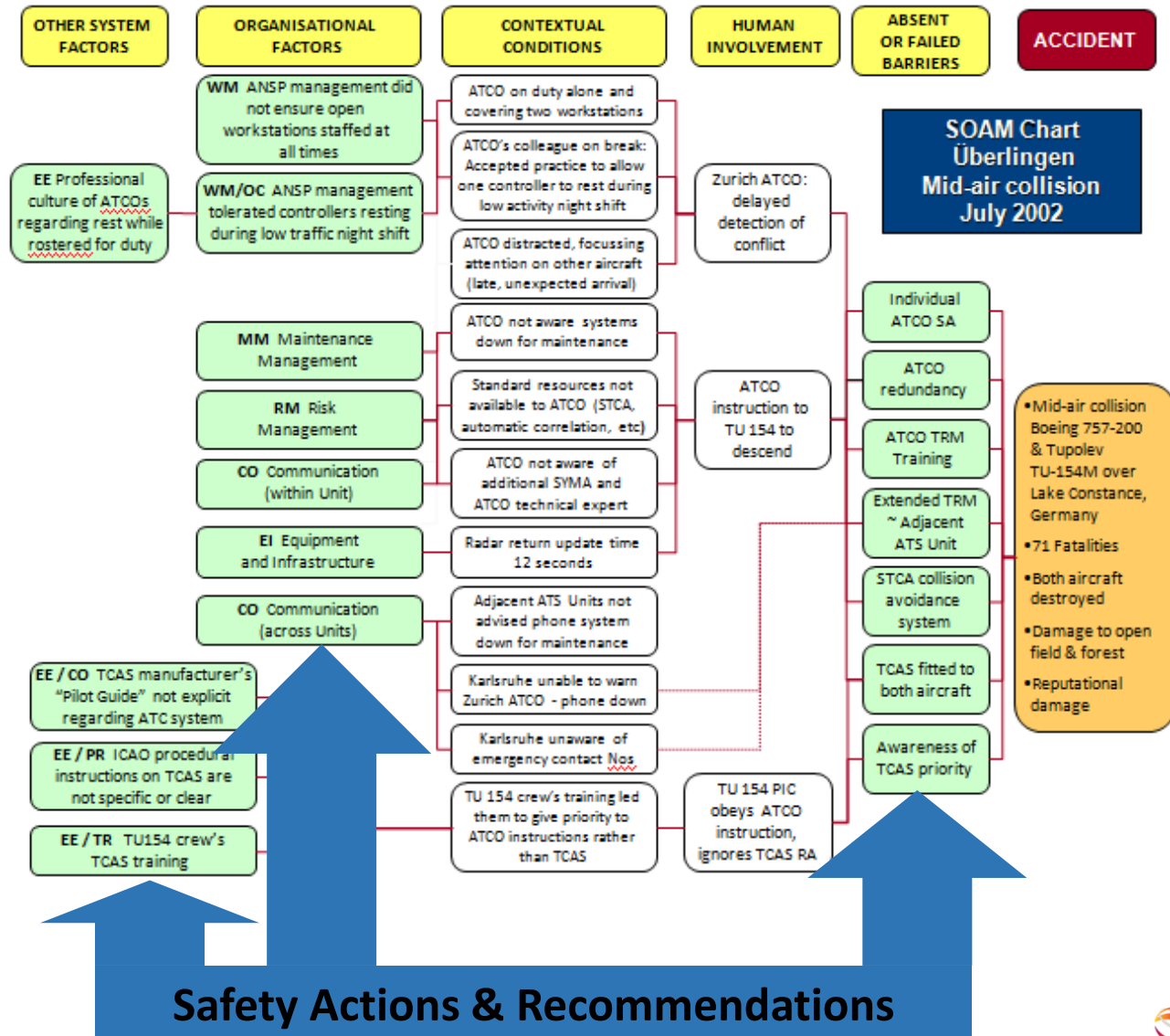
- Safety performance indicators established since 2009:

Safety Performance Indicators	
Tier 1 (<i>Overall Rate</i>)	
Aircraft Accident, Serious Incident or Incident	
Tier 2 (<i>Incident Types & Aerodrome Capabilities</i>)	
Confirmed FOD Incidents	Airfield Lighting Availability
Wildlife Strikes	Aircraft Rescue & Fire Fighting Response Times

- Focused on operational risks, rather than organisational enablers of safe outcomes
- Ongoing review to better measure the effectiveness of our SMS

Changi Airport SMS Implementation Journey

After 2009

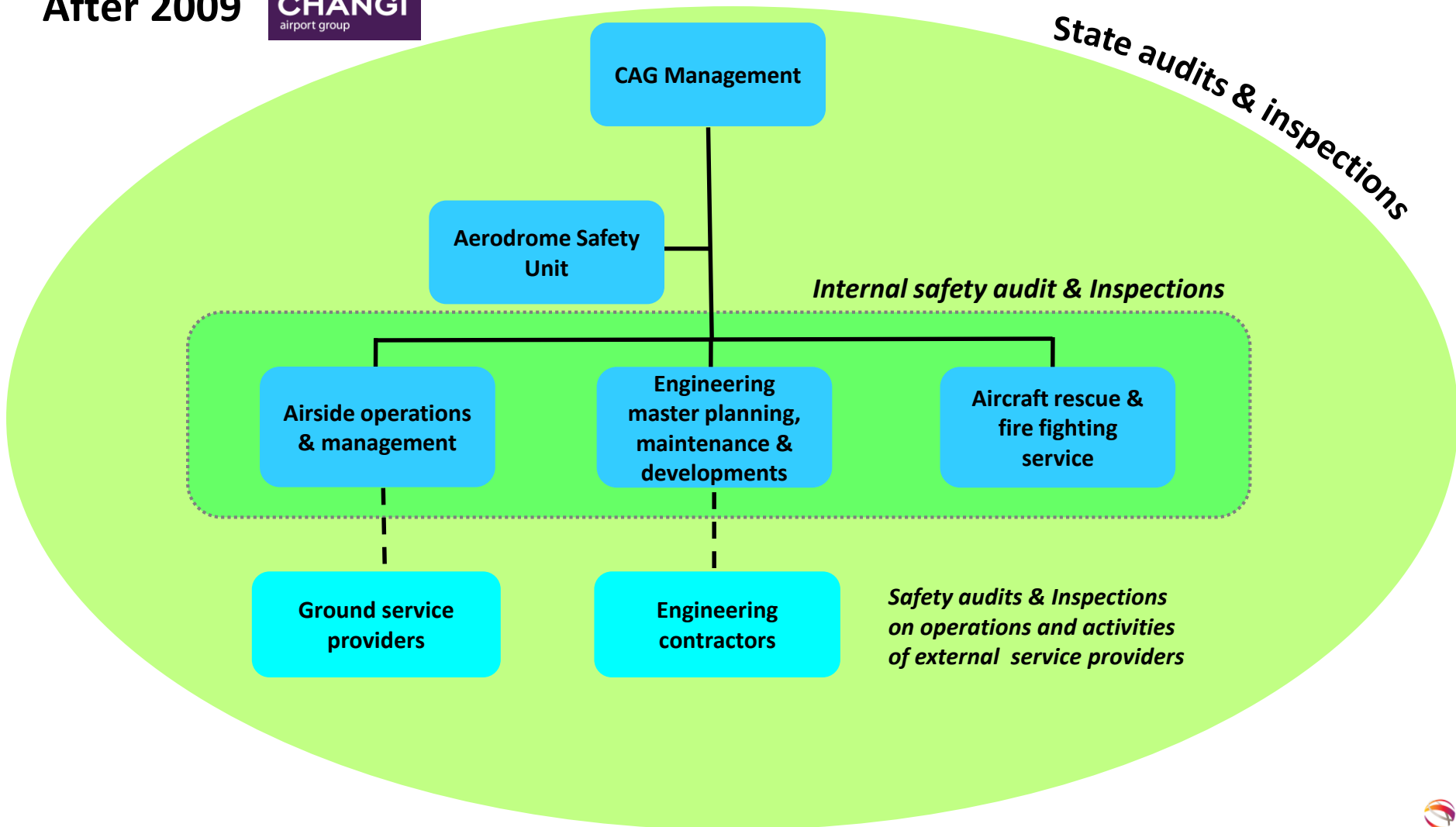


Systemic Occurrence Analysis Methodology



Changi Airport SMS Implementation Journey

After 2009



Changi Airport SMS Implementation Journey

After 2009



- SMS training for all
- Safety competency matrix for key personnel
- Tracking of competencies



Changi Airport SMS Implementation Journey

After 2009



- Importance of developing airport-wide safety culture through persistent safety communications

- Safety committees
- Airport-wide seminar
- Safety events e.g. roadshows, targeted campaigns, competitions
- Annual/quarterly Airside Safety Awards
- Airside SAFE rewards for right behaviours e.g following requirements



Changi Airport SMS Implementation Journey

After 2009



- Safety collaterals



EDG SAFETY Bulletin

Published by: EDG Safety and Standards Unit (SSU)

Think Safety. Act Safely

Safety Reminder

Must wear safety vest in airside **AT ALL TIMES.**

Construction workers were spotted without wearing safety vest.

AIRPORT EMERGENCY SERVICE

ISSUE 1.7 2014

14-BAR NEWS

COVER STORY
CPT 2014
ALWAYS READY

GO DIGITAL!

SPEED. SKILL. SAFETY

CHANGI SAFETY NEWSLETTER

CHANGI airport group

HOW VEHICLES AT THE WORKPLACE CAN KILL 3

COMBATING MICROSLEEP 4

BE OUR EYES ON THE GROUND 6

AN EXPENSIVE ERROR

UNRAVELLING THE STORY:
CONTACT BETWEEN THE AIRBUS A320 & THE AEROBRIDGE

SAFETY E-BULLETIN

What? Importance How?

What is a Hazard?

It is a *condition or an object with the potential of causing

- injuries to personnel
- damage to equipment
- loss of material or
- reduction of ability to perform a prescribed function

* CHANGI Safety Management System Manual

NEVER CROSS RED STOP BAR LIGHTS

Check with ATC if Stop Bar Lights remain red

CHANGI

ZERO ACCIDENT AND INCIDENT

NO PARKING AT EQUIPMENT RESTRAINT AREA (ERA)

CHANGI

USE MARSHALLERS WHEN REVERSING

CHANGI

Changi Airport SMS Implementation Journey

After 2009



Airport-wide safety climate survey

- ✓ Personal commitment and action towards safety;
- ✓ Management’s commitment and action towards safety;
- ✓ Safety reporting;
- ✓ Safety training;
- ✓ Effectiveness of safety communication and awareness;
- ✓ Perceived risk levels in relation to work load, pace and environment;
- ✓ Perceived safety consciousness of other airport partners;
- ✓ Just and fair culture; and
- ✓ Sharing culture



High level of self-perceived personal commitment to safety.

Good perceptions on safety training needs and provisions.

Airport staff desire safety communications

Good perception on management commitment to safety.

Small percentage hold perception that rules/procedures can be bent as long as safety is not compromised.

Can do more to share safety lessons and best practices within airport community.

Undecided on the balance between safety and efficiency.

Can do more to recognise or reward safe behaviour.

Can do more to meet staff’s needs of safety communication

Changi Airport SMS Implementation Journey

Conclusion

- Top Management commitment is crucial

COMPLIANCE ALONE

≠

BEING SAFE

Changi Airport SMS Implementation Journey

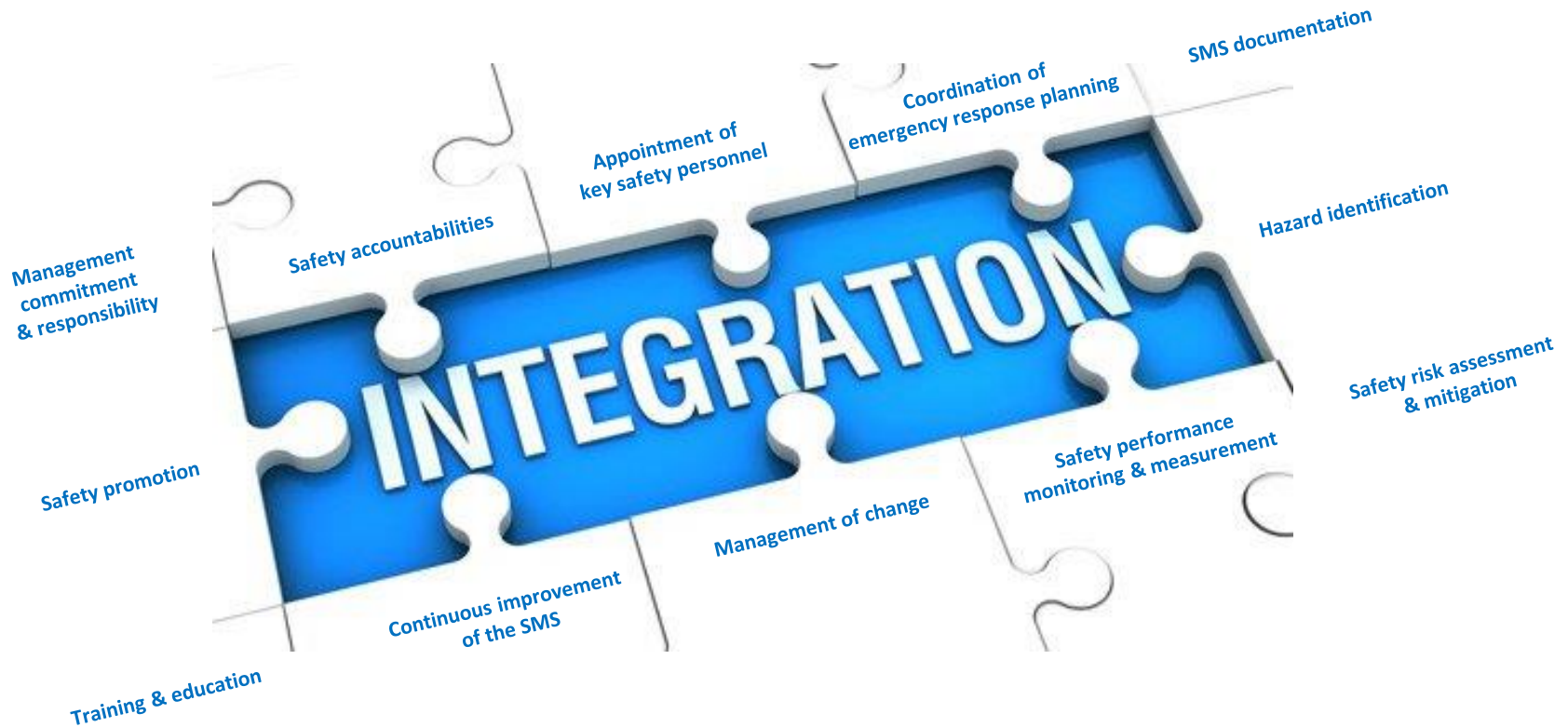
Conclusion

- Stakeholder engagement



Changi Airport SMS Implementation Journey

Conclusion



Changi Airport SMS Implementation Journey

Conclusion

SMS should commensurate with the size and complexity of the service provider's operations

Some go well with the (operating) environment...



São Paulo Cathedral

Royal Ontario Museum, Toronto



... and some, maybe not so well



lyndon.lee@changiairport.com