

Adaptation of LOSA to Single Pilot Operations – LOSA:SP

A cockpit observation methodology for monitoring safety performance of single pilot operations

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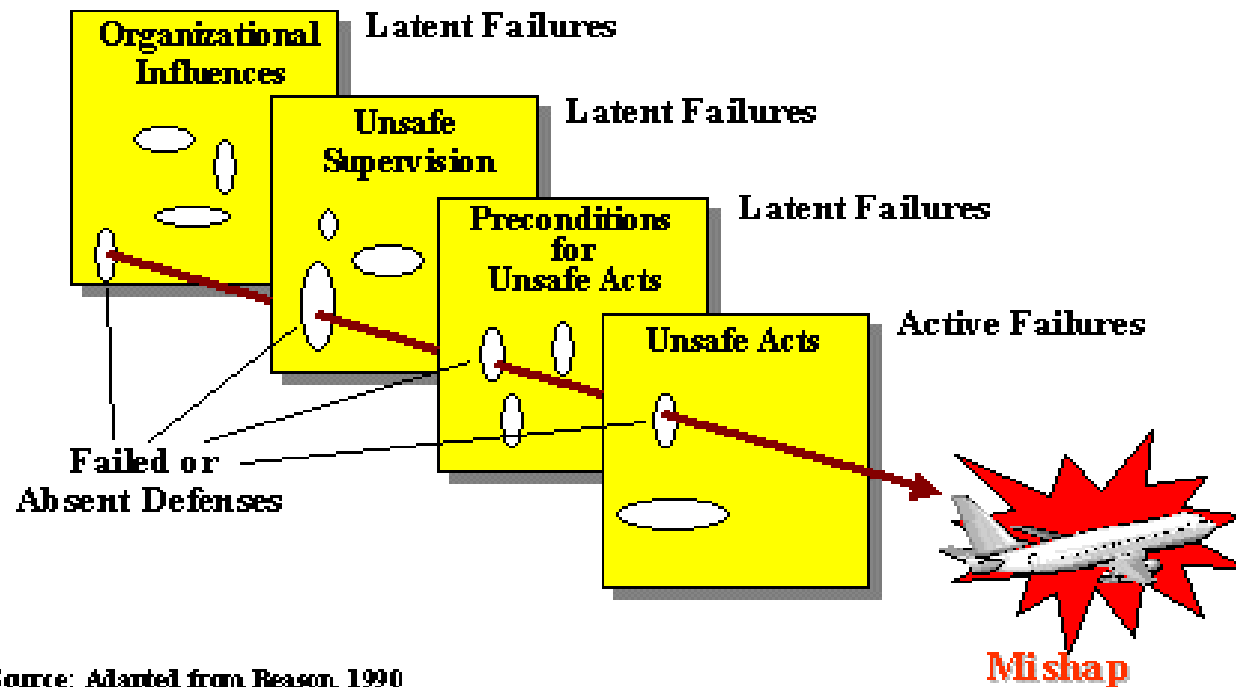
Royal Flying Doctor Service

- Unique service
- Risk assessment
 - » Sick patient v operational safety
- Best practice
- Excellent safety record
- SMS/LOSA
 - » How to enhance safety further

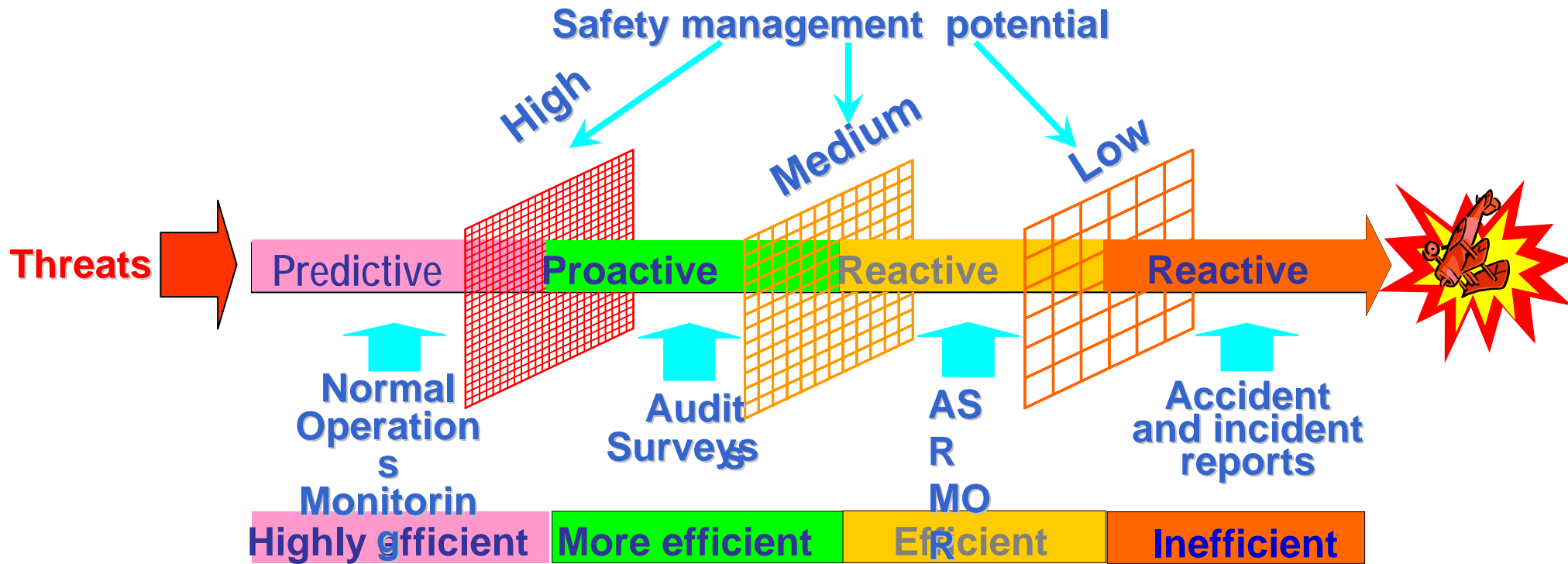


Translating safety concepts to tools

The Reason Model and Accident Causal Chain



Source: Adapted from Reason, 1990

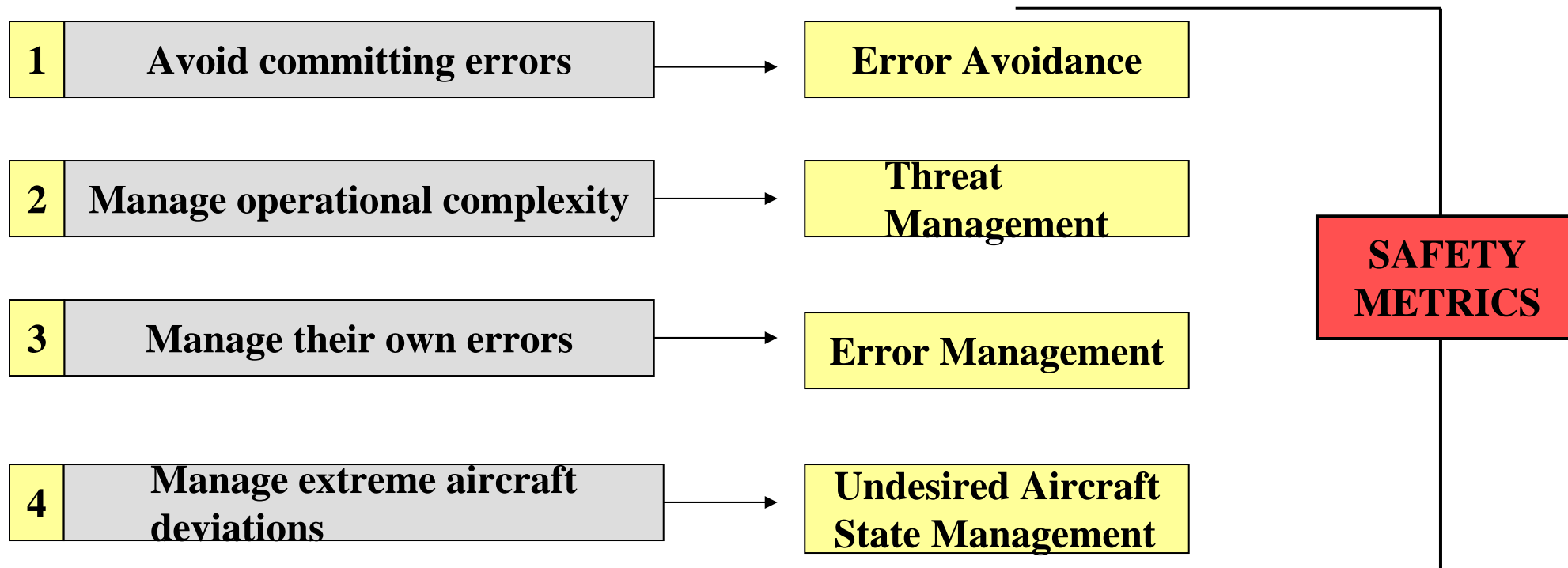


Safety management metrics

LOSA - TEM

- **Conceived at the University of Texas by Bob Helmreich and his team, LOSA has been developed and refined since 1996 with over 32 major airlines involved - ICAO**
- **The data indicators underlying this methodology are based on a conceptual framework known as Threat and Error Management (TEM)**
- **This framework proposes that threats, pilot errors and undesired aircraft states (UAS) are everyday events that flight crew must successfully manage to maintain safety**
- **The system is NON-JEOPARDY and totally confidential**

Threat and Error Management



What do flight crews do to safely fly from A to B?

A Typical Line Flight includes

- Inevitable, yet mostly inconsequential errors
- Errors can be due to flaws in *human performance*
 - » Selecting wrong frequency, incorrect readbacks, mishandling switches
- Can be fostered by *systemic shortcomings*
- Or *external threats*
 - » Late runway change, dispatch errors, maintenance problems

Many are a combination of all

An Example.....

You are driving your car behind another vehicle, cruising at 100km/hr on a fine clear day.

Then it starts raining heavily – what do you do?

- **You slow down, because you recognise your visibility is reduced.....and**
- **You increase your following distance, because your car's braking performance is reduced.**

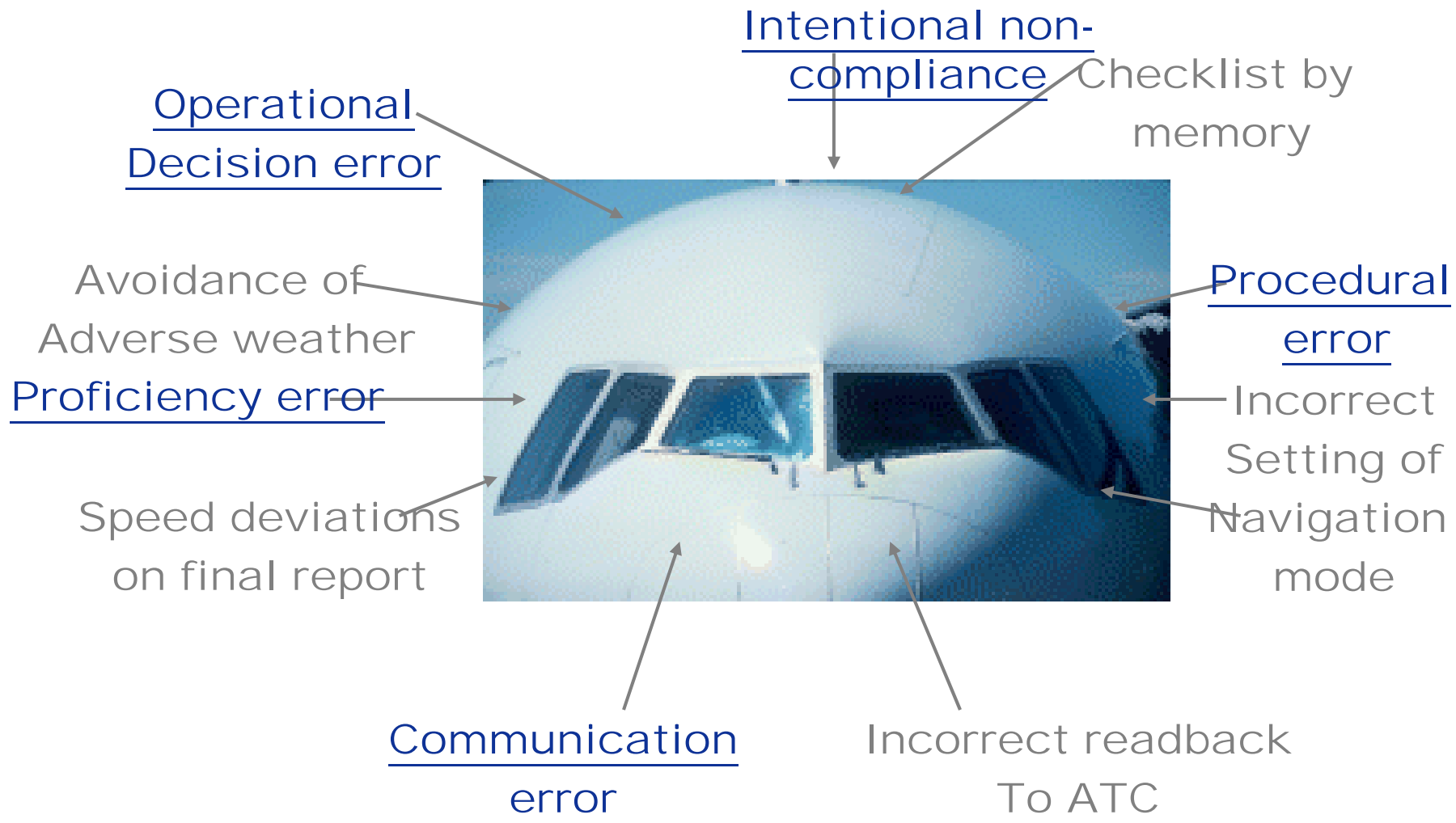
THIS IS THREAT MANAGEMENT

Threats



ERRORS

Errors by flight crew



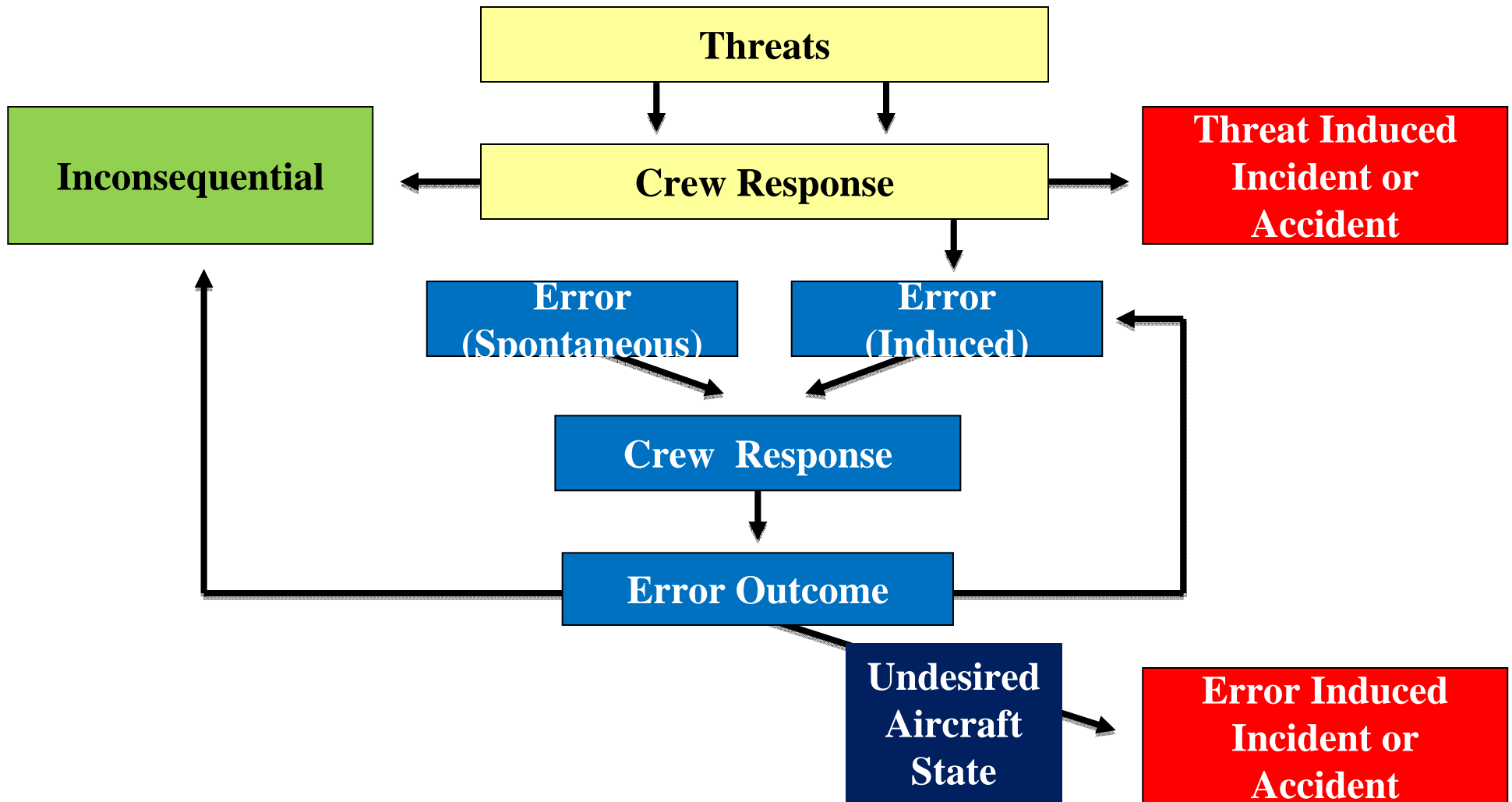
Examples of Human Error



Undesired Aircraft State (UAS)

- A position, condition or attitude of an aircraft that clearly reduces safety margins
- Result of actions by the flight crew
- Ineffective error management





Threat and Error Management Model

Process

- Companies gain a comprehensive picture of their crew's performance
- Effectively captures process – not just outcomes
- FOQA tells managers what is happening – LOSA captures the context and tells managers why
- Results presented in 3 modes
 - » High level summary
 - » Tables and charts
 - » Raw data reports

LOSA Methodology

- **Highly trained observers on flight deck to observe crew performance**
- **Avoiding 'Angel Behaviour'**
- **Complete CONFIDENTIALITY**
- **Engendering TRUST of crews**
- **Complete DE-IDENTIFICATION of data**
- **NON-JEOPARDY nature of LOSA**

- *Low pilot trust = low quality data*

Single Pilot Operations



- **Traditionally the smaller operators have experienced a higher accident rate than larger carriers**
- **Larger airlines are catered for – understandably so, and accident figures are low**
- **Incidents and accidents keep happening in General Aviation and Single Pilot operations despite efforts to increase safety**

LOSA:SP

- **LOSA has been adapted for Regional airlines with REX and Air New Zealand being the first to introduce the concept**
- **Next logical step was single pilot operations**



LOSA for Single Pilot Operations

- ***Objectives*** – It is suggested that by designing a unique research methodology for SP operations, LOSA provides an opportunity to understand the operational context, pilot processes and outcomes during SP routine flights
- **Diagnose strengths and weaknesses without relying on accident/incident data**
- ***Design*** – this study presents a field observation method of an adapted LOSA for SP operations not been used before

Study

- Feasibility study carried out at RFDS, Brisbane
- Modern fleet of King Air B200, PC12 –Pilatus, Cessna Grand Caravan C208
- ‘Virtual co-pilot’ for cross checks
- “Verbalising” activities and checks encouraged
- RFDS is single-pilot but multi-crew and have an added dimension to their risk management



Project Scope

- Introduction of LOSA to company
- Pilot study involved 2 pilot observers – volunteers
- Unique set of threats and errors – general in format for trial, based on LOSA criteria
- 4 days training – 2 days ground school, 1 day observation, 1 day recalibration
- Observers trained to be objective and capture superior performance too
- A total of 14 observations including 2 night trips
- Analysis of data and data verification
- Feedback to crew and management



Study

- Although no of observations not statistical significant, the pilot study proved that the methodology can be transferred from multi-crew to single pilot operations
- A full study is envisioned with the RFDS in QLD and Central using ARC grant money if successful
- Methodology could then be extended to other RFDS operations and commercial, single pilot flights in Australia and NZ
- Could be extended to medical
- Consider GA operations



Error Management

ICAO “When an airline commits to LOSA it must also commit to acting upon the results of the audit. LOSA is but a data collection tool. LOSA data, when analysed are used to support changes aimed at improving safety. This may include changes to procedure, policies or operational philosophy. LOSA does not provide the solutions. The solutions lie in organisational strategies. LOSA will only realise it’s full potential if the organisational willingness and commitment exist to act upon the data.” Dan Maurino, 2001

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Thank you for your attention

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