Managing Fatigue

Fatigue Risk Management- Lessons Learned and Best Practices

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Overview

- Objective
- FTL vs FM vs FRMS
- FM- Regulatory Approaches
- SMS Processes and Fatigue Management
- The Fatigue Safety Action Group. Is it just for FRMS?
- Identifying and mitigating risks
- Roles and Responsibilities

The World We Operate In

- Risk/ performance based world
- Data driven to fix larger problem vs punitive to fix smaller, more localized problems
  - Get to the core problem, not a symptom
- This applies to fatigue risks as well
  - Move from a proactive to a predictive manner in dealing with fatigue risks

Terms: FTL, FM and FRMS

- FTL- Flight Time Limitations—The Prescriptive Approach
  - e.g. Recent US and EASA flight and duty time regulations
- FM- Fatigue Management
  - In the newest of regulations is a mandatory method to look at fatigue risks more holistically— in essence, ensures that fatigue hazards are managed using the SMS processes that are in place for managing other types of hazards.
- FRMS- Fatigue Risk Management Systems
  - A data-driven means of continuously monitoring and managing fatigue-related safety risks, based upon scientific principles, knowledge and operational experience that aims to ensure relevant personnel are performing at adequate levels of alertness.

"Tiered" Levels of Compliance

Limitations

Operator Obligations

Increasing Operator Managed Risk →

Increasing Complexity →

FRMS Optional

- Customisable
- Data-driven
- Closed-loop

- Policy and documentation
- Risk management processes
- Safety assurance processes
- Safety promotion processes

Fatigue Management (SMS)

Mandatory

- Prescriptive
- Type-of-Operation
- More flexible
- Less restrictive

- Hazard identification
- Limitations taking into account identified hazards
- Continuous monitoring
- Transitional procedures
- Training for Flight Crews

Basic (Prescriptive) Mandatory

- Prescriptive
- Somewhat restrictive

- No additional obligations

Fatigue Management— First things first
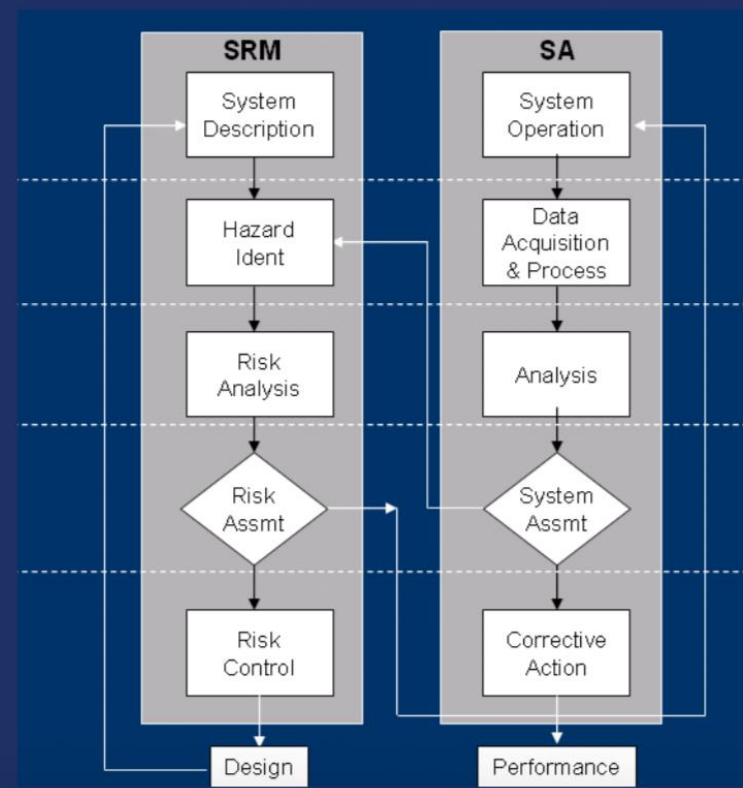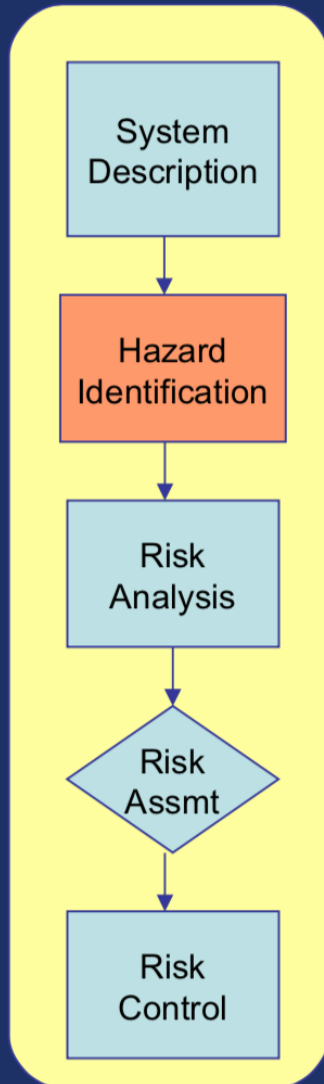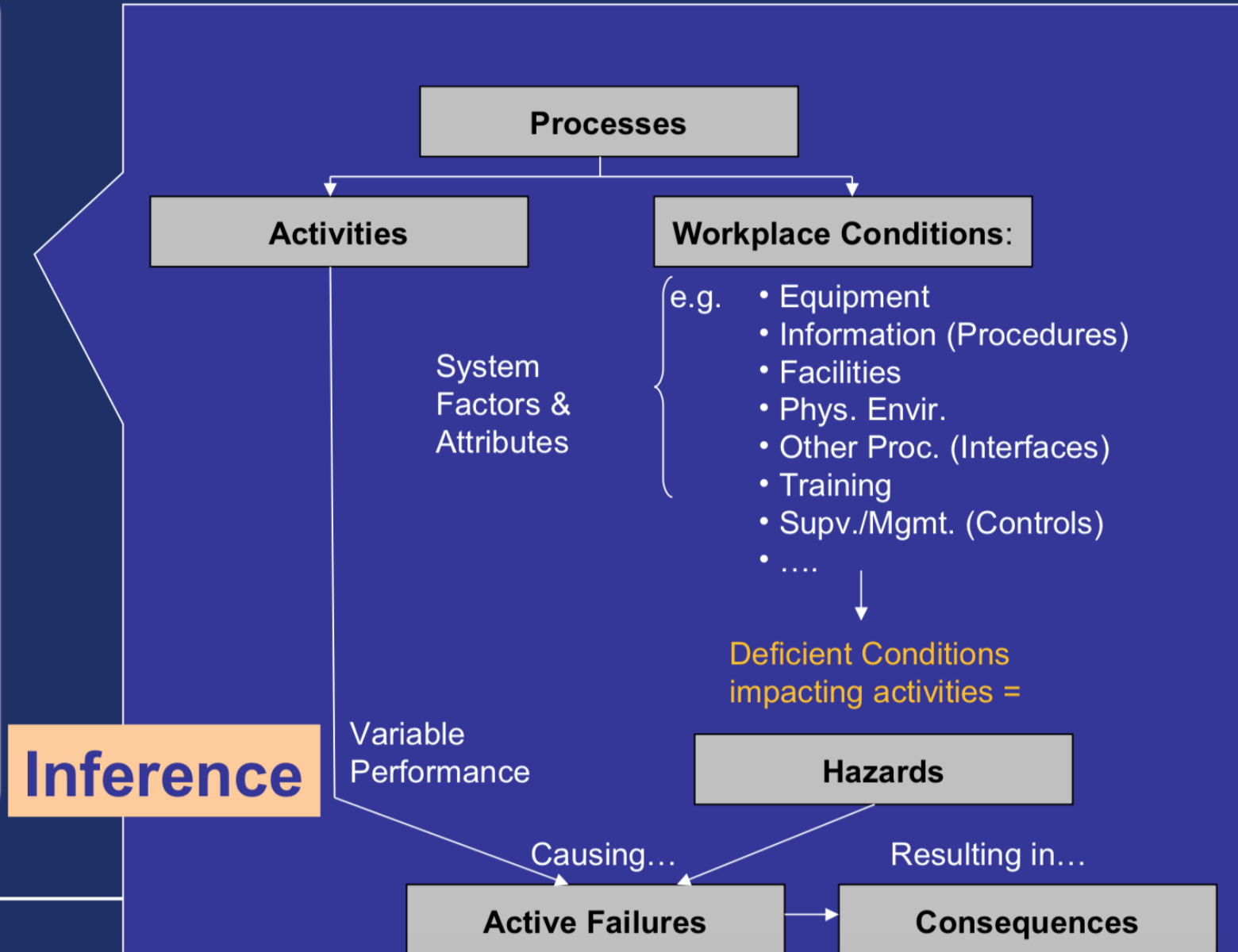
Risk Analysis

- **Important to distinguish between:**
  - *Hazard* – a condition
  - *Consequence* – result
  - *Risk* – likelihood & severity of the consequence

- **Analyzing risk** involves the consideration of both the likelihood and the severity of any adverse consequences.
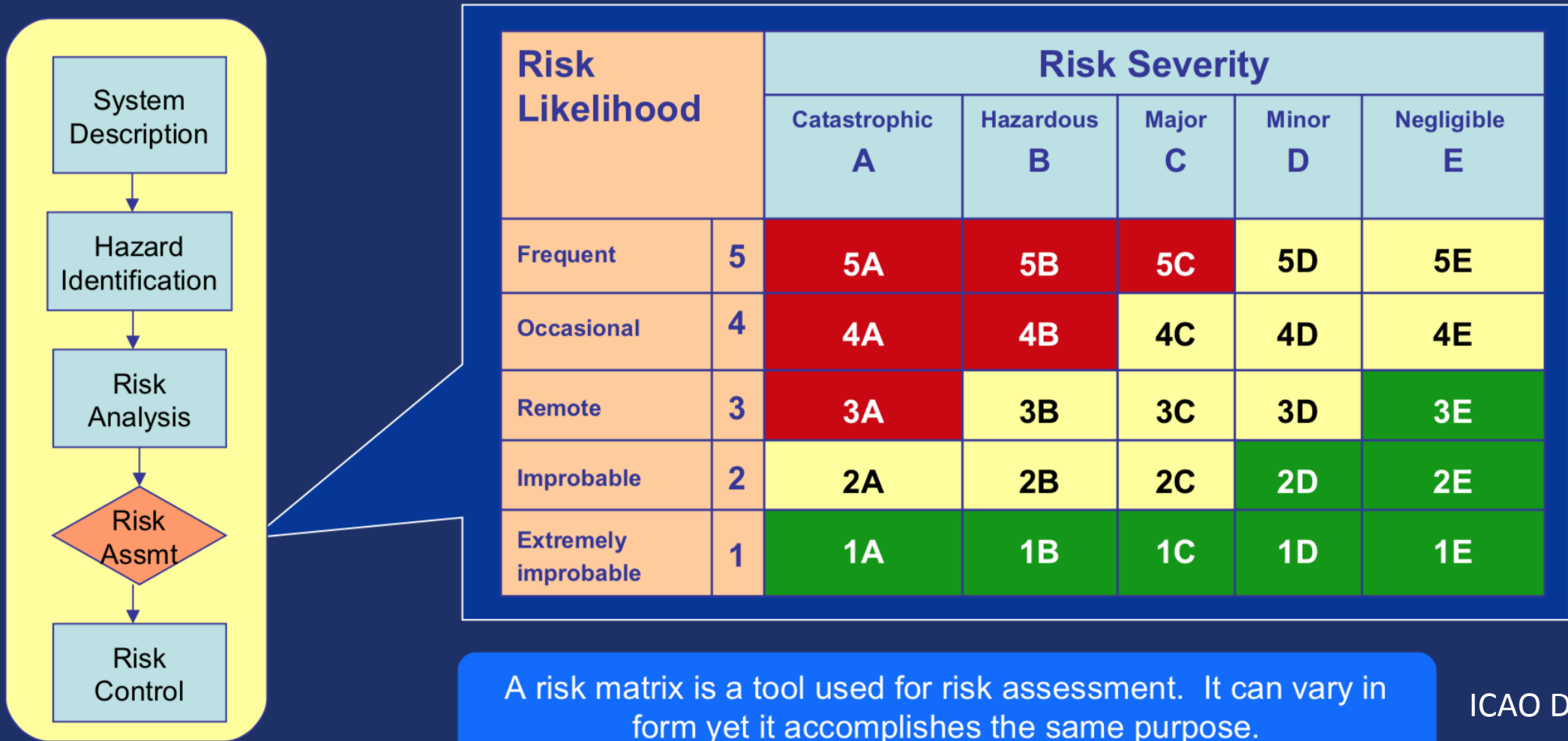

System Description
Hazard Identification
Risk Analysis
Risk Assmt
Risk Control

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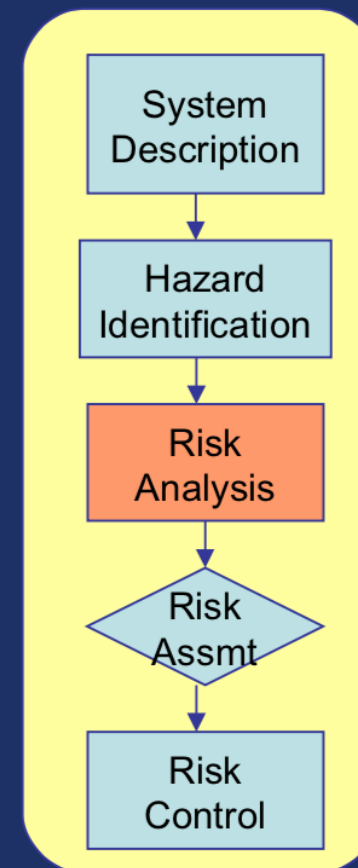
Risk Assessment

Risk assessment determines the level of risk to use in making a bottom line decision.

System Description → Hazard Identification → Risk Analysis → Risk Assmt → Risk Control

Risk Likelihood		Risk Severity				
		Catastrophic A	Hazardous B	Major C	Minor D	Negligible E
Frequent	5	5A	5B	5C	5D	5E
Occasional	4	4A	4B	4C	4D	4E
Remote	3	3A	3B	3C	3D	3E
Improbable	2	2A	2B	2C	2D	2E
Extremely improbable	1	1A	1B	1C	1D	1E

A risk matrix is a tool used for risk assessment. It can vary in form yet it accomplishes the same purpose.

ICAO Doc 9859

Risk Control = Risk Mitigation

A major component of any safety system is the **defenses (controls)** put in place to protect people, property or the environment.

These defenses are used to reduce the **likelihood** or **severity** of the consequences associated with any given hazard or condition.

System Description

↓

Hazard Identification

↓

Risk Analysis

↓

Risk Assmt

↓

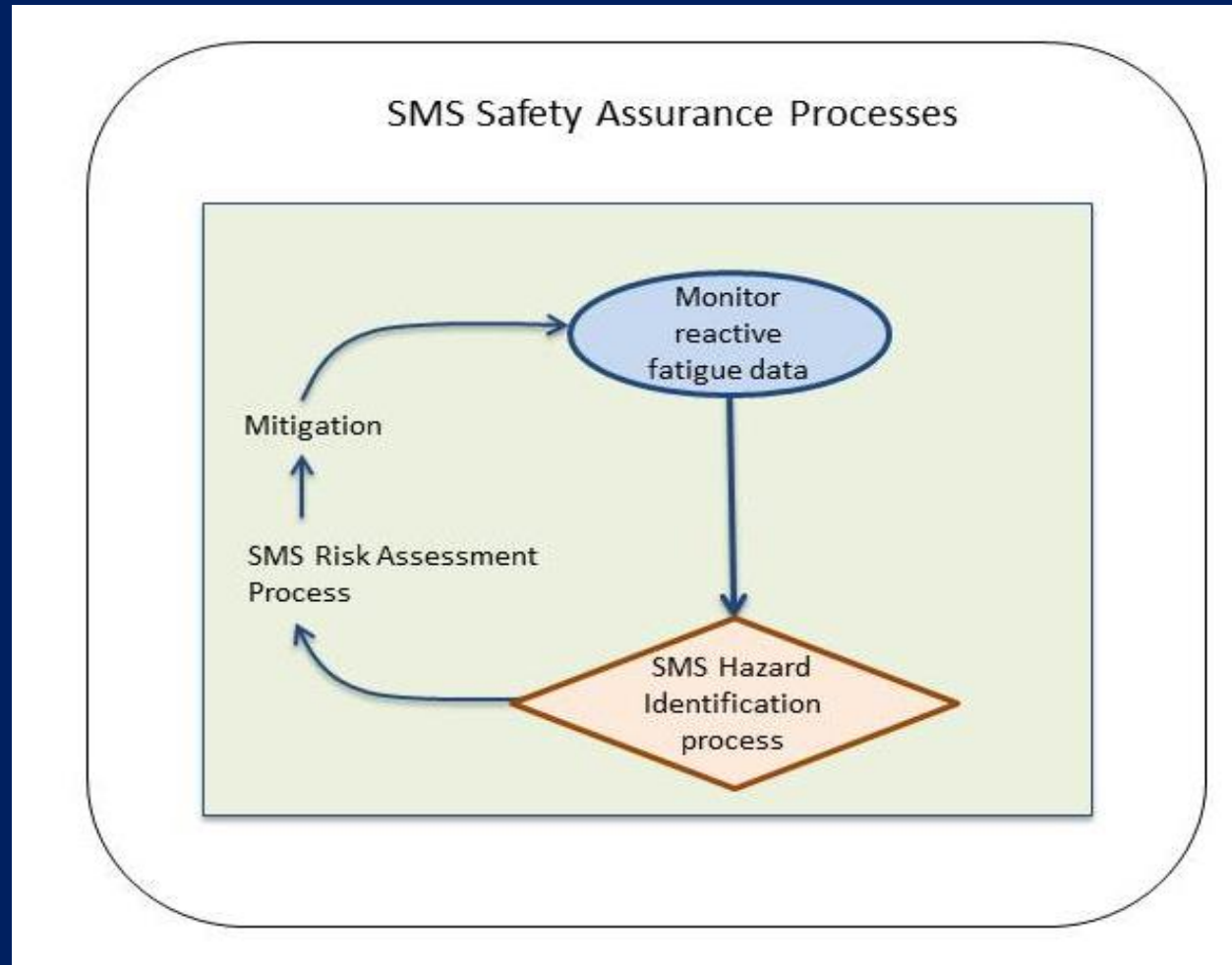Risk Control

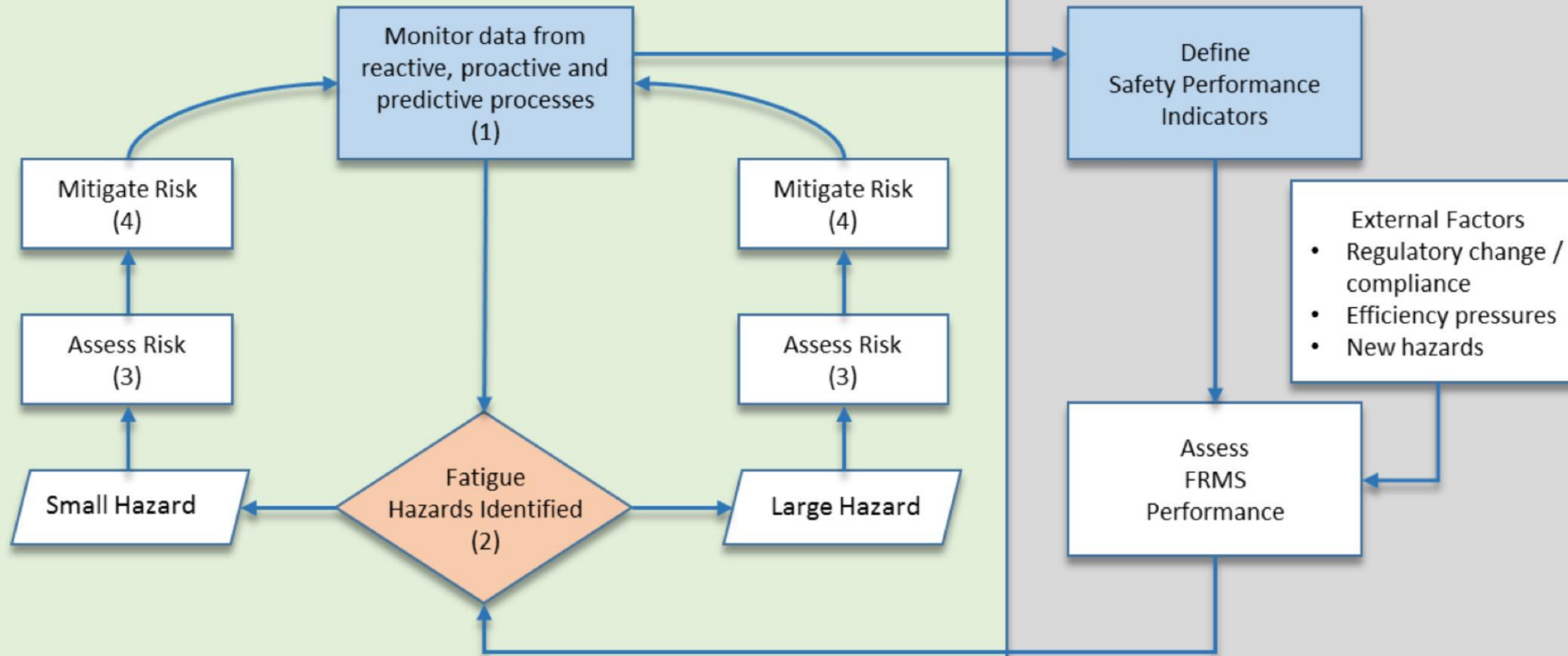ICAO Doc. 9859
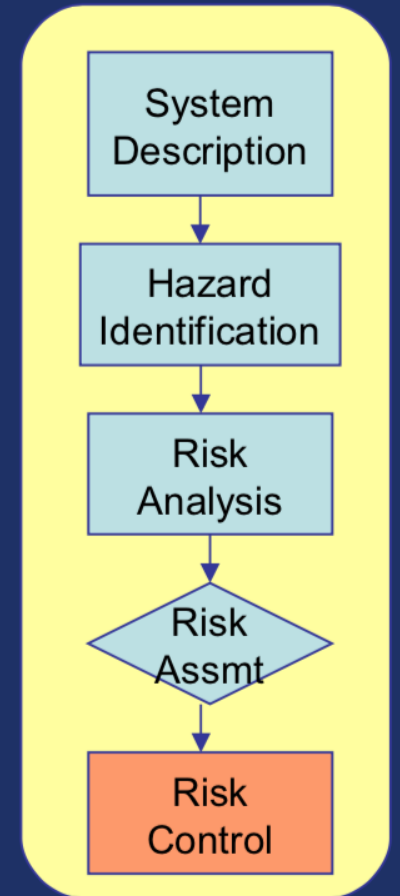
SMS Process

- Identification of Risk in Fatigue is one of the big challenges.
- Can be difficult to quantify, and measure.

SMS Safety Assurance Processes- The Foundation for FRMS

SMS Safety Assurance Processes

FMG for Airline Operators 2nd Ed

Prescriptive w/SMS

- With a prescriptive approach, fatigue is one of the possible hazards that the SMS should consider. The operator reacts when a fatigue hazard is identified.

FRMS

- With FRMS, the operator must additionally identify and assess potential fatigue risks prior to conducting operations under the FRMS as well as identifying and assessing actual fatigue risks proactively during operations.

FM as a Springboard to FRMS

Limitations

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Increasing Complexity →

	FRMS **Optional**	
➤ Customisable ➤ Data-driven ➤ Closed-loop		➤ Policy and documentation ➤ Risk management processes ➤ Safety assurance processes ➤ Safety promotion processes
➤ Prescriptive ➤ Type-of-Operation ➤ More flexible ➤ Less restrictive	**Fatigue** **Management (SMS)** **Mandatory**	➤ Hazard identification ➤ Limitations taking into account identified hazards ➤ Continuous monitoring ➤ Transitional procedures ➤ Training for Flight Crews
➤ Prescriptive ➤ Somewhat restrictive	**Basic (Prescriptive)** **Mandatory**	➤ No additional obligations

The Fatigue Safety Action Group

"It's not just for breakfast anymore"

The Fatigue Safety Action Group (FSAG)

- **Although not required by the SARPs, it is recommended that operators establish a Fatigue Safety Action Group (FSAG) with responsibility for coordinating FRMS activities.** Since fatigue management must be based on shared responsibility and requires an effective safety reporting culture, *it is strongly recommended that the FSAG includes representatives of all stakeholder groups* (management, scheduling staff, and crew member representatives) with input from other individuals as needed to ensure that it has appropriate access to scientific, statistical, and medical expertise. Inclusion of all stakeholders is an important strategy for promoting engagement in the FRMS

The Fatigue Safety Action Group—

The principle functions of the FSAG are to:

➢ oversee the development of the FRMS;

➢ assist in FRMS implementation;

➢ oversee the ongoing operation of the FRM processes;

➢ contribute as appropriate to the FRMS safety assurance processes;

➢ maintain the FRMS documentation; and be responsible for ongoing FRMS training and promotion.

The Fatigue Safety Action Group—
Is it just for FRMS?

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The FSAG and Hazard Identification

5.2.2. HAZARD IDENTIFICATION

The ICAO SARPs (Annex 6 Part 1, Appendix 7) require three types of hazard identification:

1. Predictive
- fatigue hazards identified by examining planned work schedules (rosters), taking into account factors known to affect sleep and fatigue.
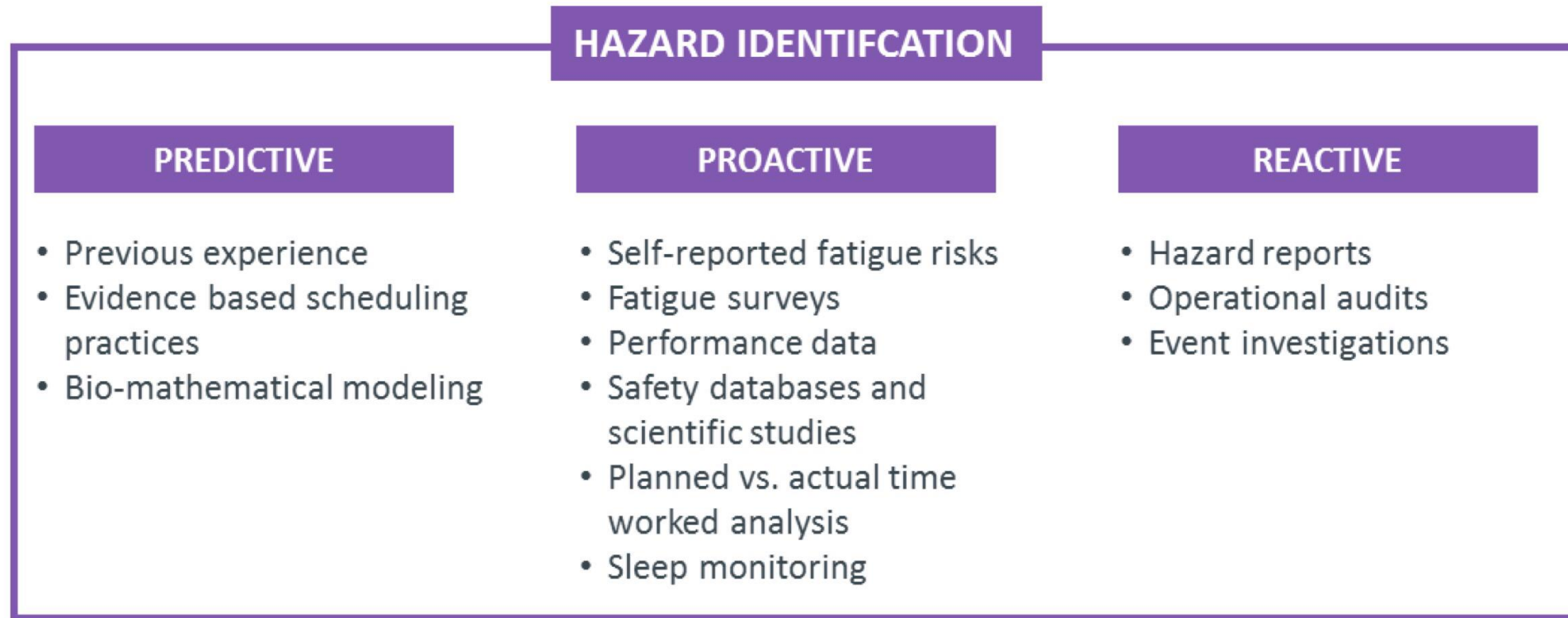
2. Proactive (monitored during operations)
- fatigue hazards identified by measuring fatigue levels in current operations.

3. Reactive (gathered after an event or incident)
- fatigue hazards identified by assessing the contribution of fatigue to safety reports and events that have occurred.

FSAG and Hazard Identification Data

ICAO SARPs also propose suitable types of data that can be monitored:

HAZARD IDENTIFCATION

PREDICTIVE
- Previous experience
- Evidence based scheduling practices
- Bio-mathematical modeling

PROACTIVE
- Self-reported fatigue risks
- Fatigue surveys
- Performance data
- Safety databases and scientific studies
- Planned vs. actual time worked analysis
- Sleep monitoring

REACTIVE
- Hazard reports
- Operational audits
- Event investigations

Fatigue Risk

- Methods to deal with fatigue risk
  - <u>Reactive</u>- e.g. 'fix' a rotation after publishing
  - <u>Proactive</u> - e.g. 'fix' a rotation in the pre-month building process
  - <u>Predictive</u>- e.g. set a process where potential risk mitigations are built into pre-month solution
- Fatigue Risk examples
  - Hotel drive time to short layover
  - Hotels quality before and after a redeye or international flight
  - Flying scheduled before and after a redeye, including more than one redeye on a pairing

Identifying Risks-
Data, the need to collect and protect

- Remember the Objective
  - Enhance safety and increase alertness by reducing the fatigue threat
  - Use the data for what it is intended for
- Do not use data collection and use for industrial purposes
  - The temptation will be strong at times
- When possible, establish mutually agreed upon methods to codify protections
  - Letters of agreement, memorandum of understanding, contractual provisions
  - Institutionalizes the process and objectives

Roles and Responsibilities

- Pilots
- Operators
- Regulators

Thank You!