



**MAYDAY!
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**Learning from aviation
to prevent disaster**

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Universitat
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Panamedia
International Flight School

Preservation and Archiving Special Interest Group
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Zen Master Seung Sahn

“Master, what is wisdom?”
“Never make mistakes”
“And how can I become wise?”
“By making mistakes!”

4 February 2015. 10:55 LT - Republic of China

Aircraft type: ATR 72-600

Operator: TransAsia Airways

Flight origin: Taipei Songshan Airport. SongSahn. Taipei (Taiwan)

Destination: Kinmen Airport, Kinmen (Taiwan)

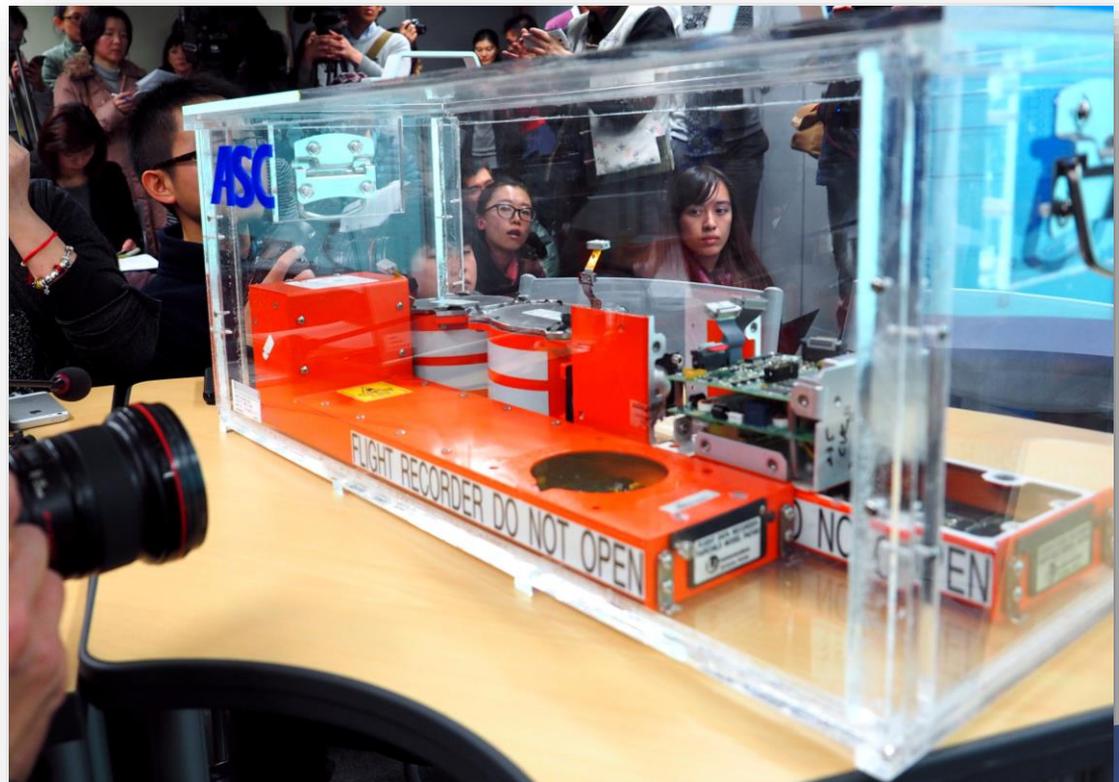
Passengers: 53

Crew: 5

Fatalities: 43

Survivors: 15

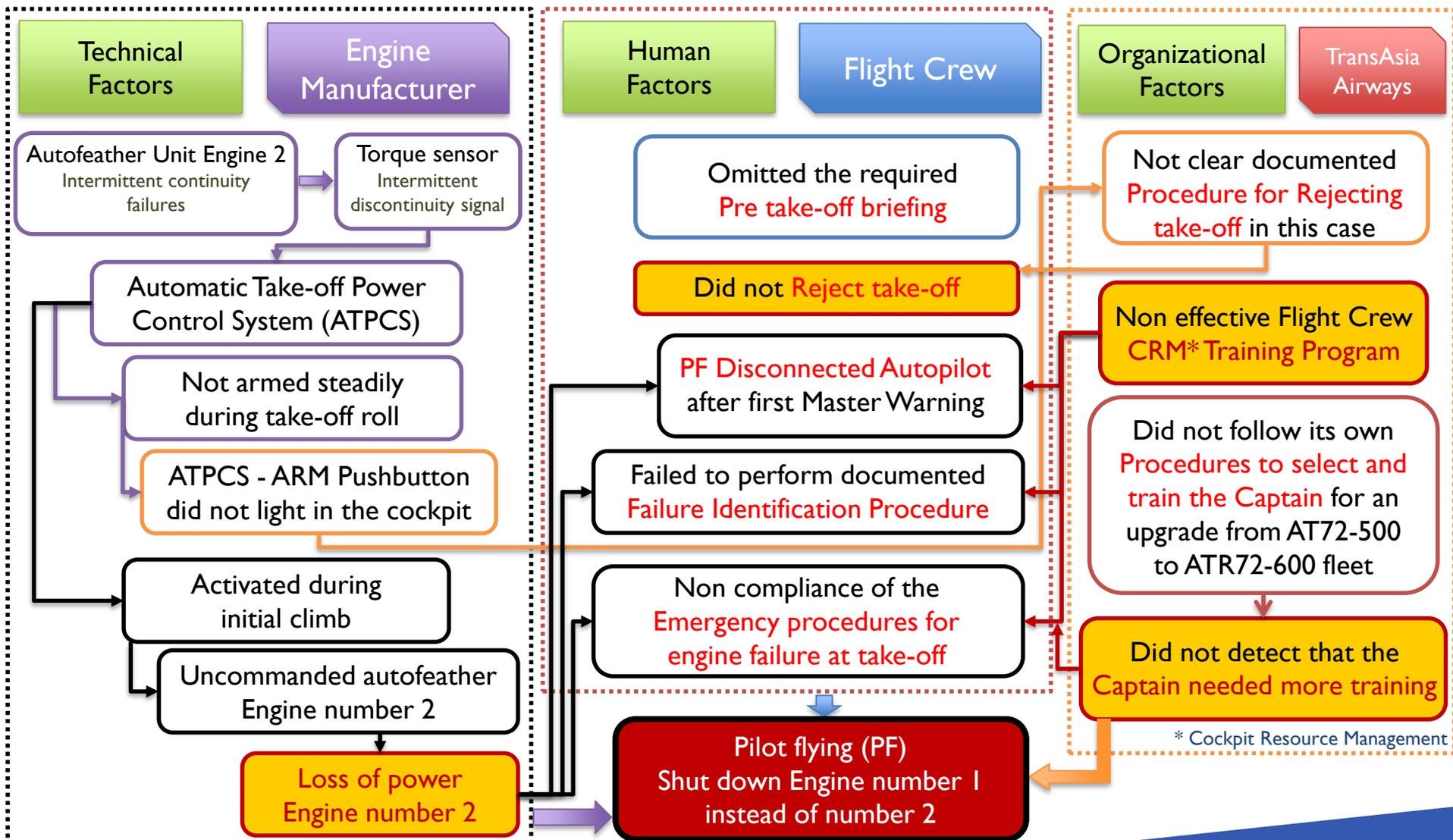
Ground injuries: 2



Causes of the accident

Every accident, no matter how minor, is a failure of the organization

Jerome F. Lederer



What is Safety?



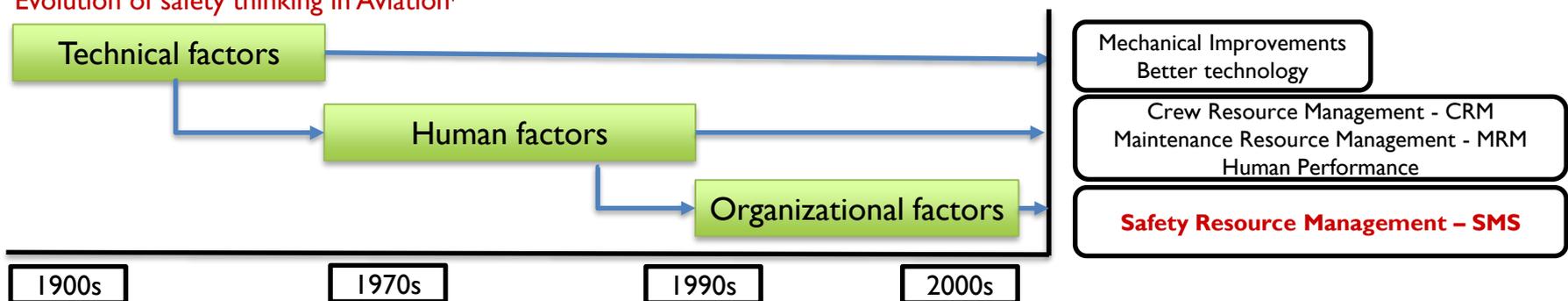
Risk management is a more realistic term than safety. It implies that **hazards are ever-present**, that they must be

- Identified
- Analysed
- Evaluated
- Controlled or rationally accepted

Jerome F. Lederer
NASA director of the Office of Manned Space Flight Safety for the Apollo Program

Right now the odds of any one flight being your last one is remote: 1 to 11,000,000

Evolution of safety thinking in Aviation¹



¹ ICAO. (2013). *Doc 9859 Safety Management Manual (SMM)*. Quebec, Canada: ICAO.

FAA. (2016). *Safety Management System*. Washington, USA: U.S. Department of Transportation
Retrieved from <https://www.faa.gov/about/initiatives/sms/explained/basis/>

Safety Management System - SMS

SMS is the formal, top-down, organization-wide approach to managing safety risk and assuring the effectiveness of safety risk controls. It includes systematic procedures, practices, and policies for the management of safety risk.

4 SMS COMPONENTS²

1. SAFETY POLICY

Establishes senior management's commitment to continually improve safety; defines the methods, processes, and organizational structure needed to meet safety goals

2. SAFETY RISK MANAGEMENT SYSTEM

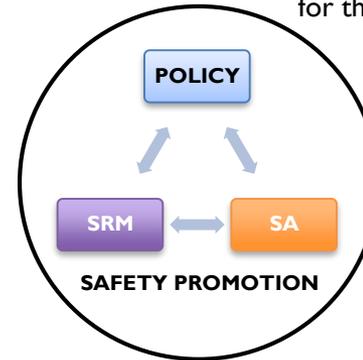
Determines the need for, and adequacy of, new or revised risk controls based on the assessment of acceptable risk

3. SAFETY ASSURANCE

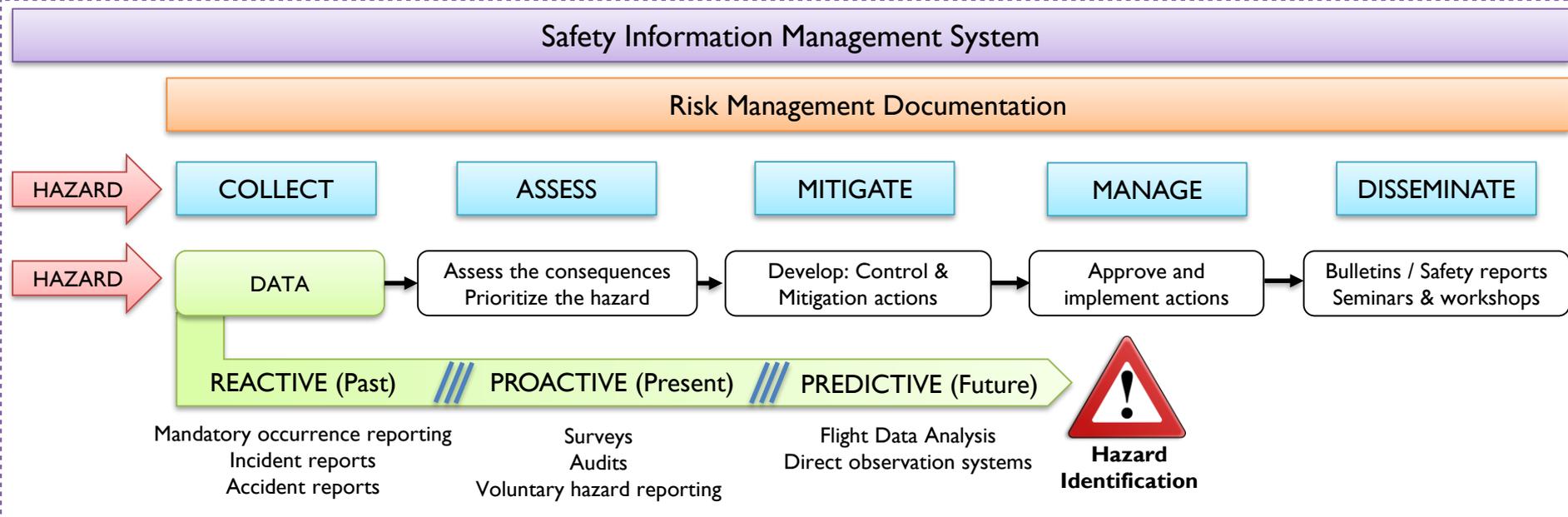
Evaluates the continued effectiveness of implemented risk control strategies; supports the identification of new hazards

4. SAFETY PROMOTION

Includes training, communication, and other actions to create a positive safety culture within all levels of the workforce



2. Safety Risk Management - SRM: Hazard documentation and follow-up risk management process



²ICAO. (2013). *Doc 9859 Safety Management Manual (SMM)*. Quebec, Canada: ICAO.

LIBNOVA offered
LIBDATA storage arrays.
UIB rejected the offer



LIBSAFE ACQUISITION 2015

2017

LIBSAFE OPERATIVE 2019



LIBNOVA detects a risk
in our system:
Our 2 Storage Disks
could be of the same provider
and manufacturing batch



LOSS OF DATA
3.281 Files: 248 GB
University of the
Balearic Islands - UIB
Migration from an old
Tape Backup System
to a new one

2016

LIBSAFE INSTALLED
2 Storage Disks
acquired by UIB

2018

Are we safe?

The 2 storage disks could fail at the same
time in case of a manufacturing defect

ONE MORE STEP IS NECESSARY

NDSA Levels of Digital Preservation

LIBSAFE + 2 UIB Storage Disks Same provider & manufacturing batch

Categories	1. Protect	2. Know	3. Monitor	4. Repair
Storage and Geographic Location	●	●	●	●
File Fixity and Data Integrity	●	●	●	●
Information Security	●	●	●	●
Metadata	●	●	●	●
File Formats	●	●	●	●

LIBSAFE + 3 UIB Storage Disks Same provider & manufacturing batch

Categories	1. Protect	2. Know	3. Monitor	4. Repair
Storage and Geographic Location	●	●	●	●
File Fixity and Data Integrity	●	●	●	●
Information Security	●	●	●	●
Metadata	●	●	●	●
File Formats	●	●	●	●



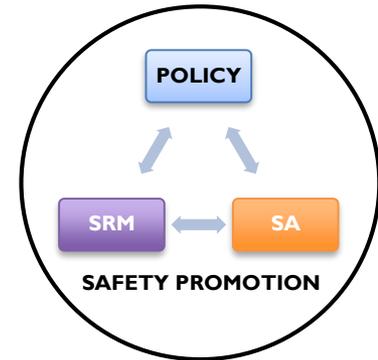
What is interesting here is to observe how the
NDSA Levels are not designed to manage safety risk and, therefore, to detect potential risks associated with technical, human and organizational factors

One more step
One new proposal

NDSA Levels of Digital Preservation

Categories	Level 1	Level 2	Level 3	Level 4
Storage and Geographic Location	●	●	●	●
File Fixity and Data Integrity	●	●	●	●
Information Security	●	●	●	●
Metadata	●	●	●	●
File Formats	●	●	●	●
SAFETY & RISK MANAGEMENT	SAFETY POLICY	SAFETY PROMOTION	SAFETY RISK MANAGEMENT SYSTEM	SAFETY ASSURANCE

NEW NDSA CATEGORY
BASED ON SAFETY MANAGEMENT SYSTEMS



Safety Management System
a dynamic *Risk Management System* based on *Quality Management Systems* (QMS) principles in a structure scaled appropriately to the operational risk, applied in a *safety culture environment*.³

- I. SAFETY POLICY**
- 2.1 Management commitment and responsibility
 - 2.2 Safety accountabilities
 - 2.3 Appointment of key safety personnel
 - 2.4 Coordination of emergency response planning
 - 2.5 SMS documentation

- 2. SAFETY PROMOTION**
- 1.1 Training and education
 - 1.2 Safety communication

- 3. SAFETY RISK MANAGEMENT SYSTEM - SRM**
- 3.1 Hazard identification
 - 3.2 Safety risk assessment and mitigation

- 4. SAFETY ASSURANCE - SA**
- 4.1 Safety performance monitoring and measurement
 - 4.2 The management of change
 - 4.3 Continuous improvement of the SMS

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libnova

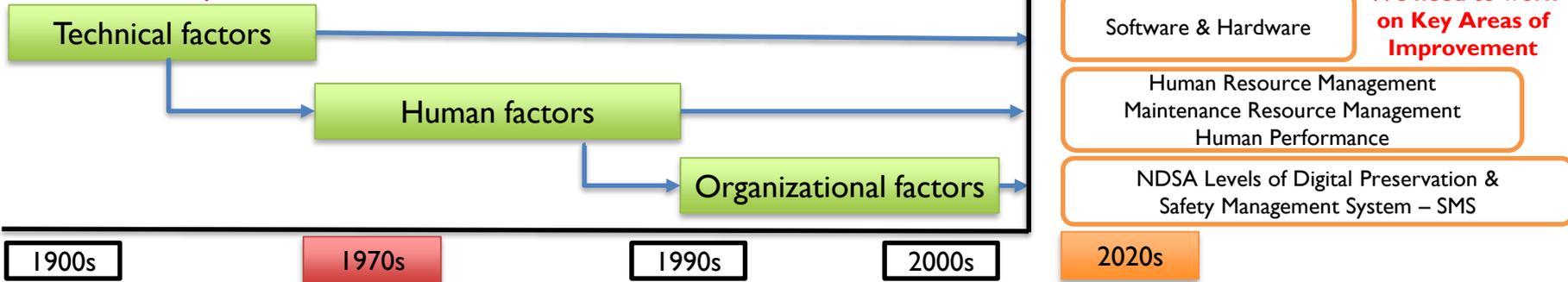
Collaborate to implement Safety Management Systems (SMS) structures, using the Aviation Know-How, to the field of Digital Preservation

³Stolzer, Alan J.. (2015). *Safety Management System*. Farnham, England: Ashgate Publishing Limited.

Where are we in Digital Preservation?

We are in the 1970s in terms of safety compared with the Aviation and Aerospace industry

Evolution of safety in Aviation



We are in the 1970s



SKY IS THE LIMIT





THANK YOU!

PASIG 2019 Mexico