



INTERNATIONAL SAIL TRAINING AND TALL SHIPS CONFERENCE
2018

SESSION 5D
INCIDENT ANALYSIS –
IDENTIFYING ROOT CAUSES AND LESSONS LEARNT





Identifying causal factors of a MISHAP:

Implementing the HFAC System Aboard EAGLE

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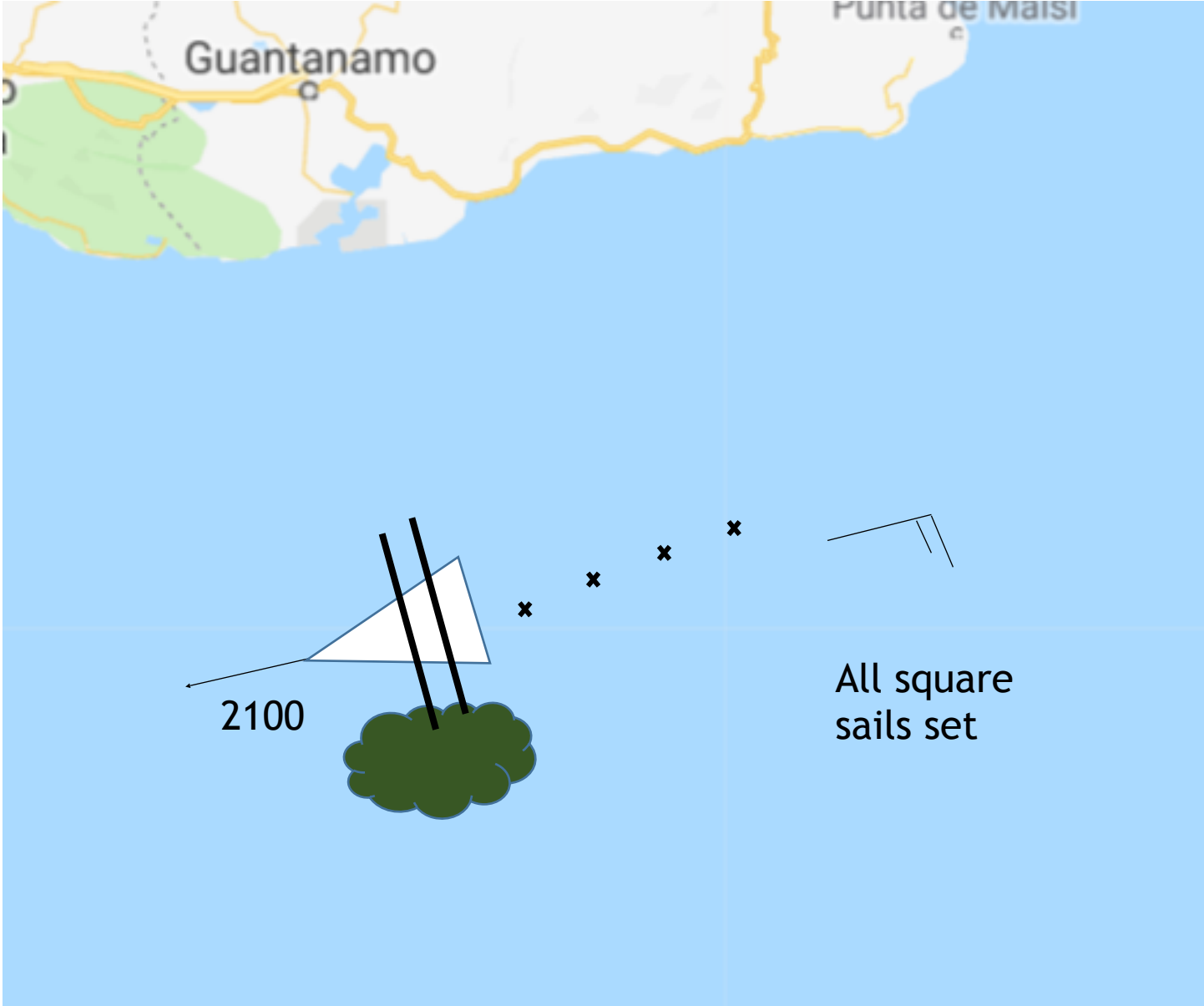
School of Ship

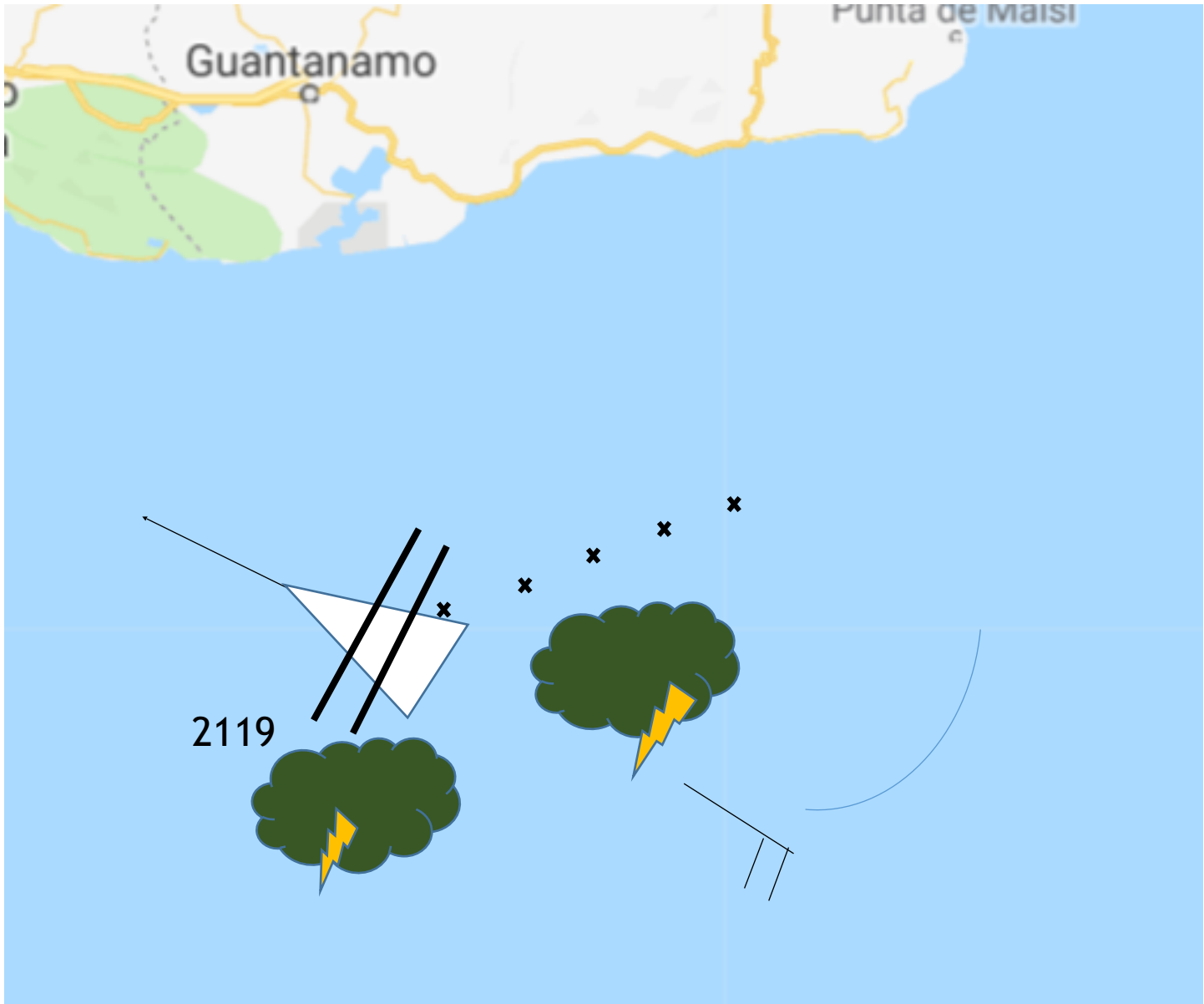


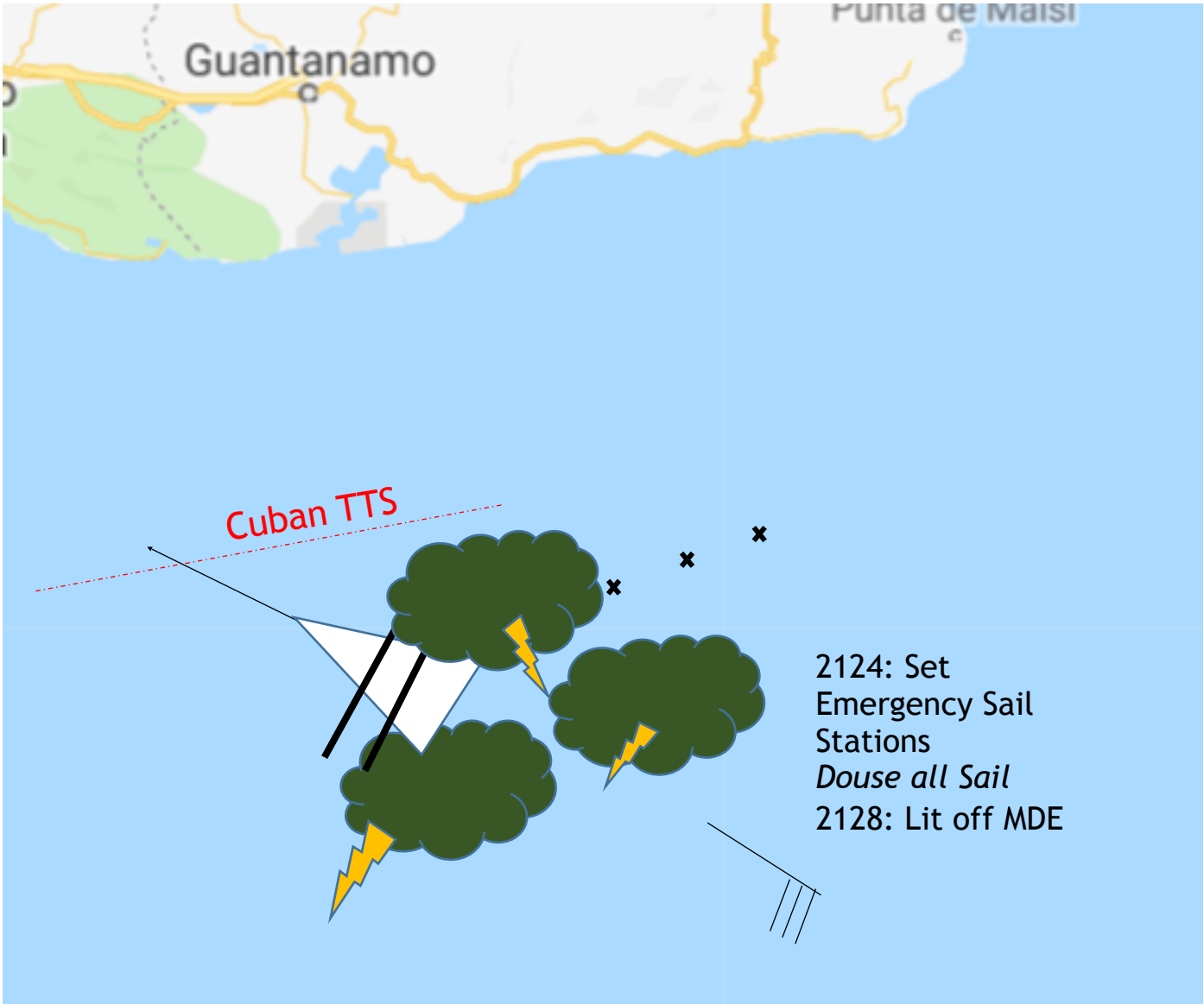












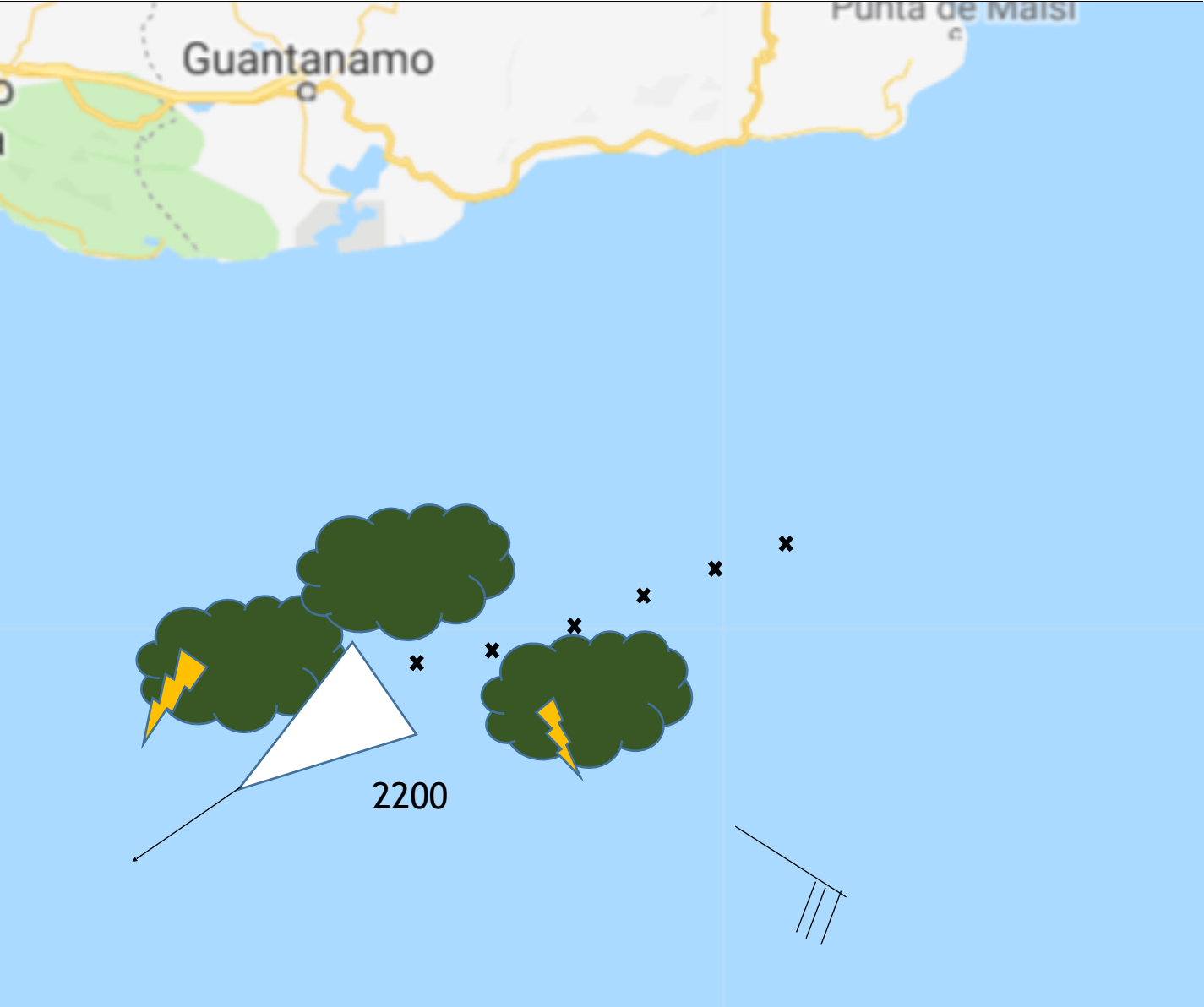
Guantanamo

Punta de Maisí

Cuban TTS

2124: Set
Emergency Sail
Stations
Douse all Sail
2128: Lit off MDE







Futtocks Shrouds





HFACS

Human
Factors
Analysis
Classification
System

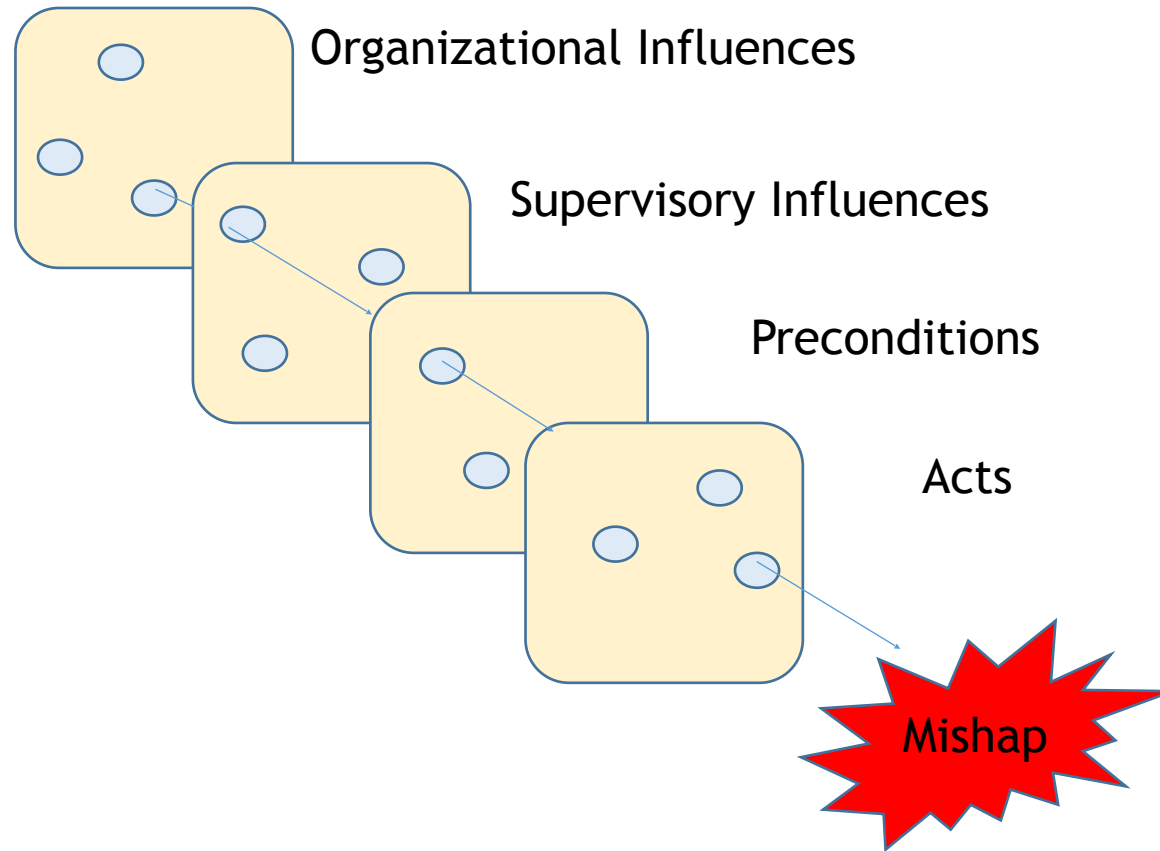
HFACS History

- Created by the Department of Defense in 2003
- Initially to investigate aviation mishaps
- Used by US government agencies
- 1-week school at National Transportation Safety Board (NTSB) training facility

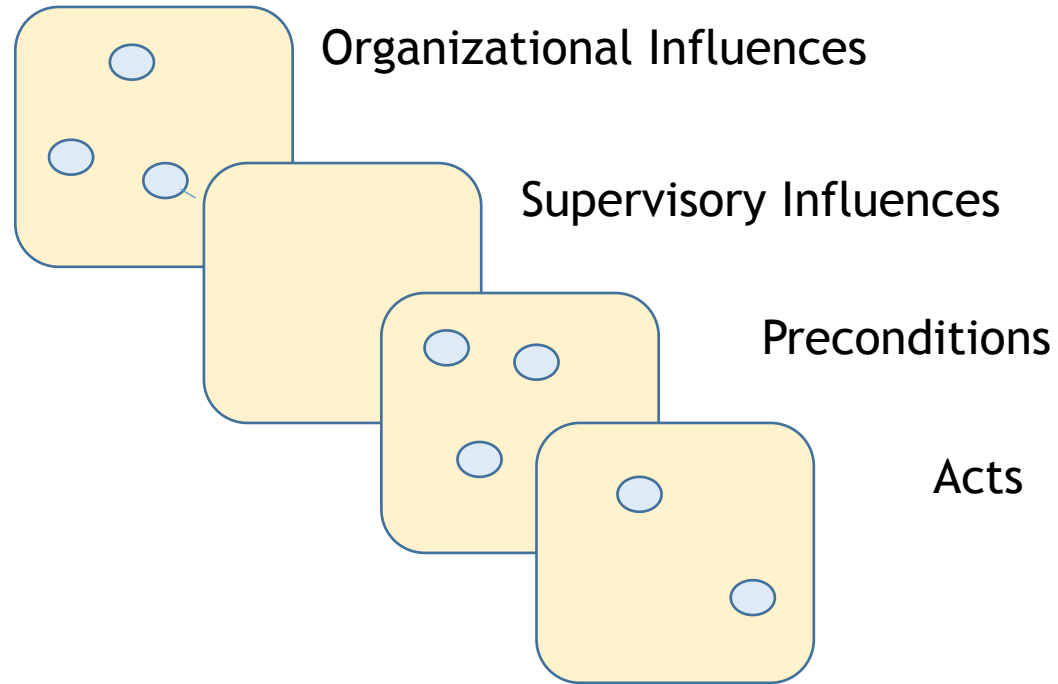
HFACS goals

- Identify cascading effects causal to a mishap
- Standardizes process used by those who investigate mishaps
- Provides a standard taxonomy for investigation/ data collection

Mishaps are not due to a single point of failure...



Remove a point of failure...

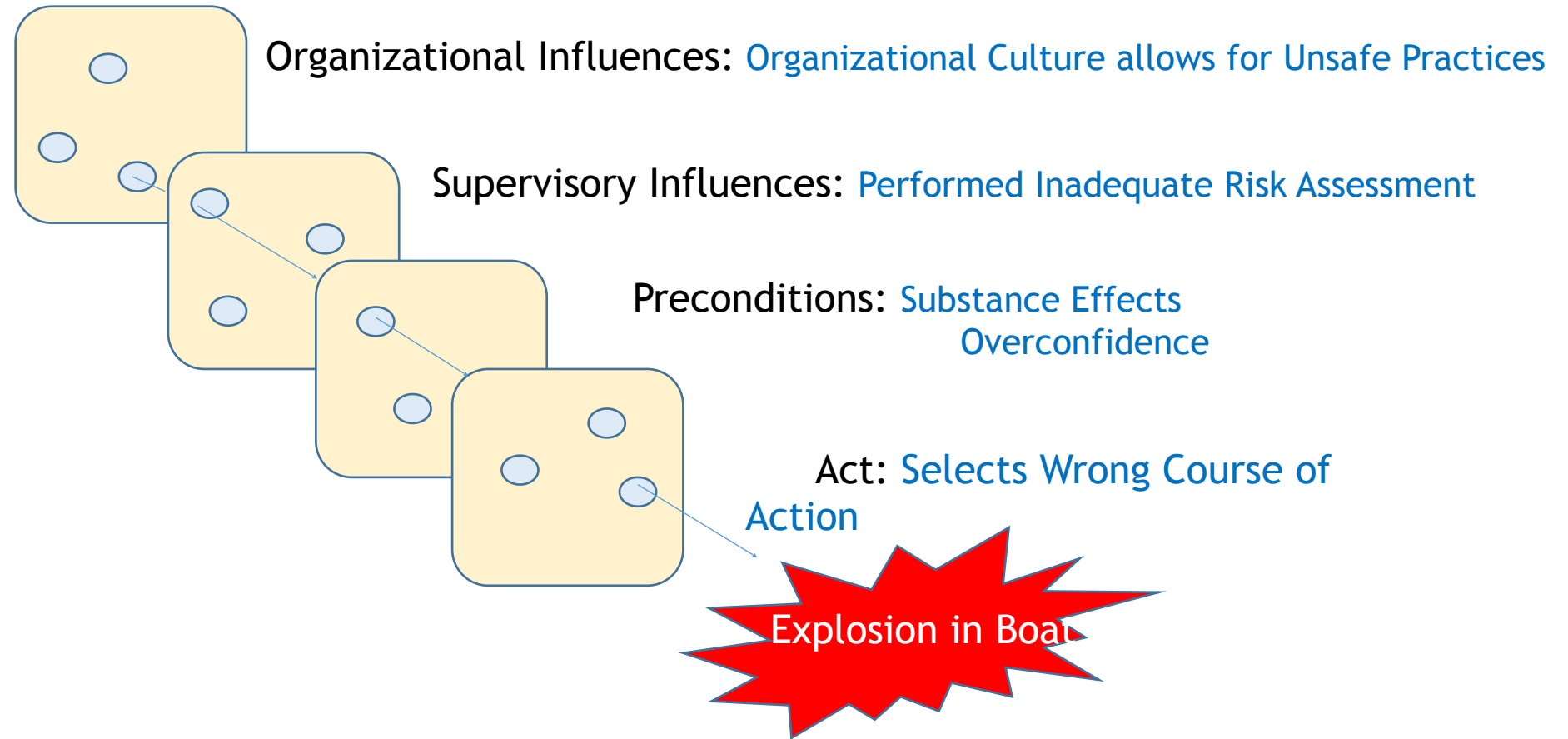


MISHAP

...no



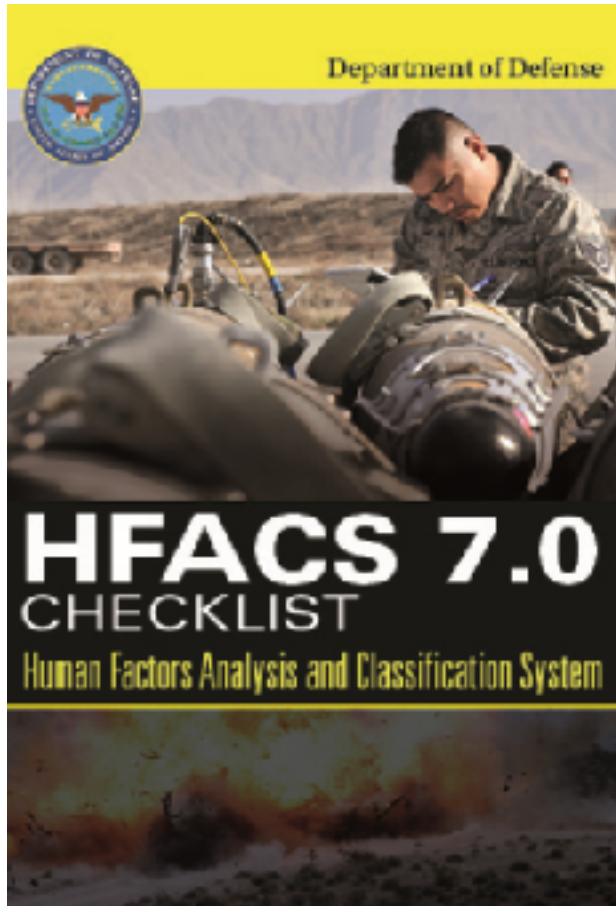
Captain Haddock Example



Application of HFACS

Timeline

- Members of board identified (4-6 people, including a technical expert)
- Mishap occurs
- Collect data (logs, plan of day, bloodwork, take pictures)
- Interview witnesses & chain of command/ organization leaders
- Convene board
- Work through HFACS booklet



Buy it online! ~ \$5 USD each

Unit Mishap Board Goals

- 1) Identify causal factors/root cause using HFACS
- 2) Identify lessons learned for training/ implementation

Step 1: Identify the Act

ACTS
Active Failures or Actions


Performance-Based Errors (AE100)

Performance-Based Errors (AE100) are factors that occur when a specific action is performed in a manner that leads to a mishap.

Unintended Operation of Equipment	AE101
Checklist Not Followed Correctly	AE102
Procedure Not Followed Correctly	AE103
Overcontrolled/Undercontrolled Aircraft/ Vehicle/System	AE104
Breakdown in Visual Scan	AE105
Rushed or Delayed a Necessary Action	AE107

AE101 Unintended Operation of Equipment is a factor when an individual's movements inadvertently activate or deactivate equipment, controls or switches when there is no intent to operate the control or device. This action may be noticed or unnoticed by the individual.

AE102 Checklist Not Followed Correctly is a factor when the individual, either through an act of commission or omission, makes a checklist error or fails to use an appropriate checklist.



Review MISHAP

- ID root cause via HFACS
- ID lessons learned → training

AE 103 - procedure not followed correctly

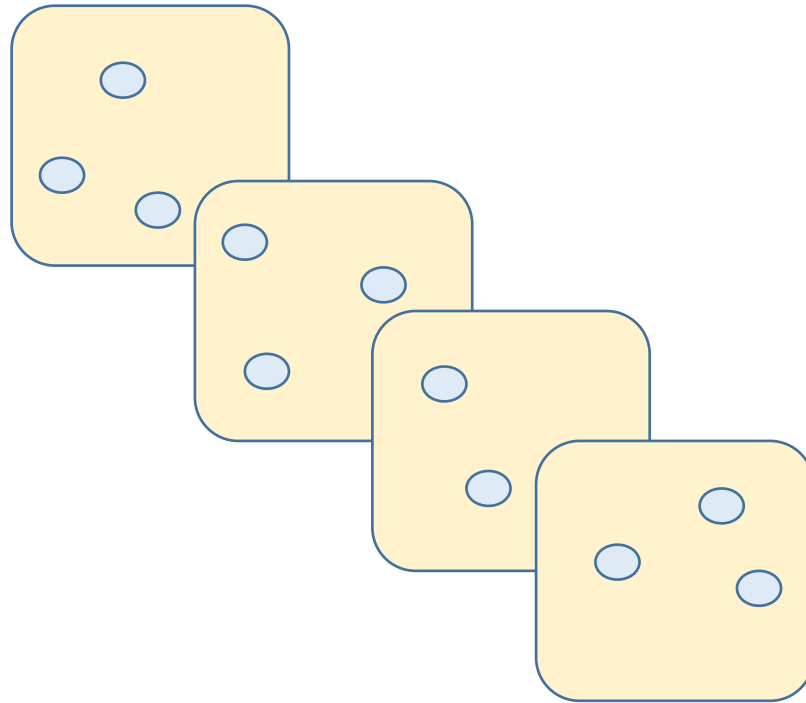
AE 107 - rushed or delayed necessary action

201 - inadequate risk assessment

206 - erroneous COA

PC-3

? - wear



Act: AE206 Erroneous Course of
Action



Step 2: Identify Preconditions

PRECONDITIONS
Latent Failures or Conditions

Environment
The environment surrounding a mishap includes the physical or technological factors that affect practices, conditions and actions of individuals.

Physical Environment (PE100)
Physical Environment (PE100) are factors when weather, climate, fog, brownout (dust or sandstorm) or whiteout (snowstorm) affect the actions of individuals.

Environmental Conditions Affecting Vision	PE101
Vibration Affects Vision or Balance	PE103
Heat/Cold Stress Impairs Performance	PE106
External Force or Object Impeded an Individual's Movement	PE108
Lights of Other Vehicle/Vessel/Aircraft Affected Vision	PE109
Noise Interference	PE110

PHYSICAL ENVIRONMENT

PRECONDITIONS


PRECONDITIONS

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PRECONDITIONS

PRECONDITIONS

SUPERVISION



PC 101 - obstructed vision? - weather related

PC 110 - noise interference

PC 203 - visibility obstructions - design

PC 207 - PX equipment interference

PC 208 - communication issue PPIDs Failure Effect (ca)

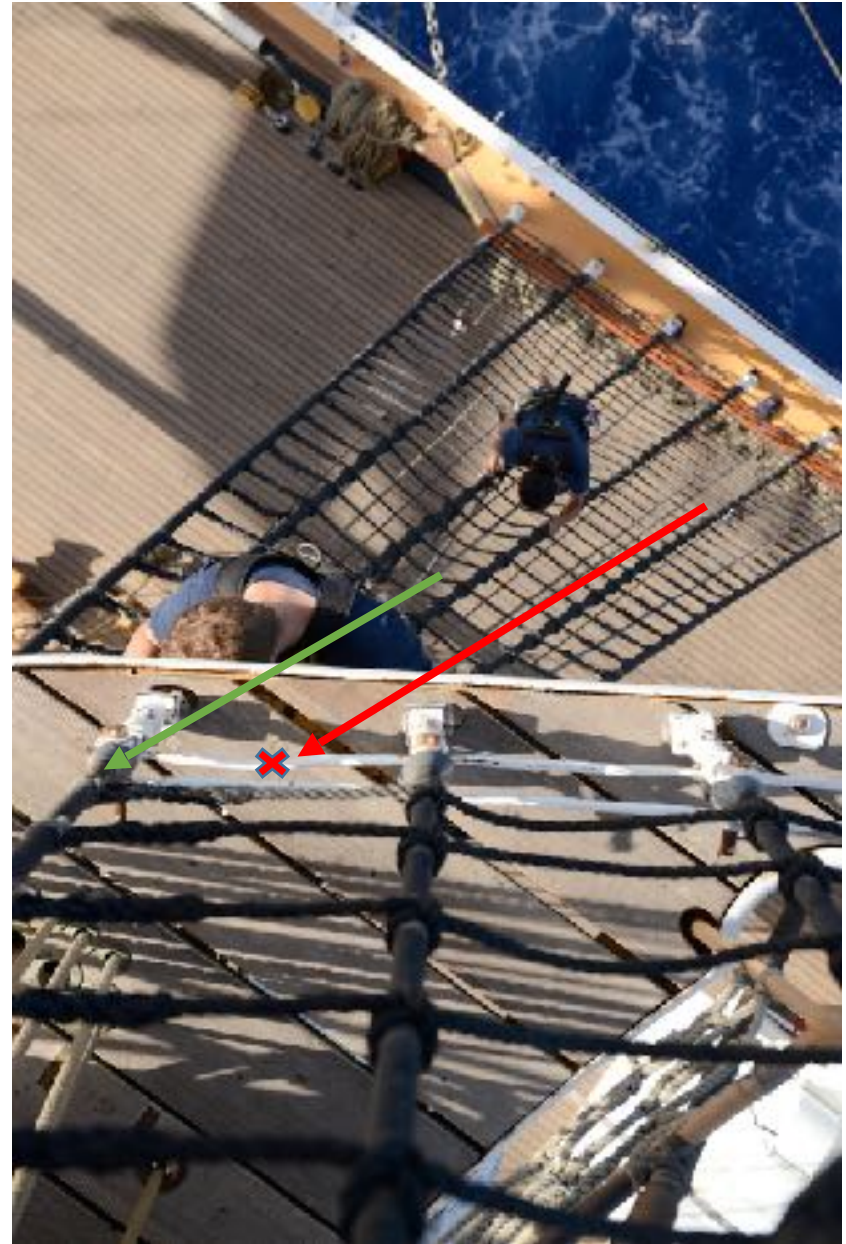
PC 307 - Fatigue

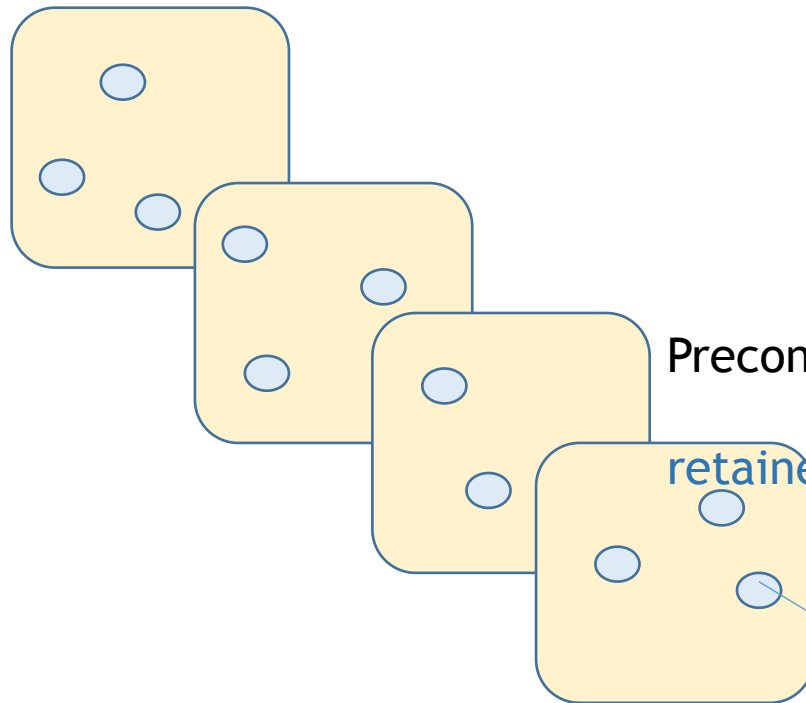
PC 315 - heat exhaustion

PC 504 - misperception of air environment

PC 109 - Technical/procedural knowledge not retained

Inappropriate Team Composition? SPOL - Directed to the beyond





Preconditions: PC 307 - Fatigue
PC 109- Technical/ Procedural knowledge not retained

Act: AE206 Erroneous Course of Action



Fall from Rig

Step 3: Identify supervisory flaws.

SUPERVISION
Direct Supervisory Chain of Command

Supervision
Supervision is a factor in a mishap if the methods, decisions or policies of the supervisory chain of command directly effect practices, conditions or actions of the individual(s).

Supervisory Violations (SV000)

Supervisory Violations (SV000) are factors when supervisors willfully disregard instructions or policies.

Failure to Enforce Existing Rules (Supervisory Act of Omission)	SV001
Allowing Unwritten Policies to Become Standard	SV002
Directed Individual to Violate Existing Regulations	SV003
Authorized Unqualified Individuals for Task	SV004

SV001 Failure to Enforce Existing Rules (Supervisory Act of Omission) is a factor when operating rules have not been enforced by a supervisor.

SV002 Allowing Unwritten Policies to Become Standard is a factor when unwritten or unofficial policy is perceived and followed by the individual, although it has not been formally recognized by the organization.

SV003 Directed Individual to Violate Existing Regulations is a factor when a supervisor directs a subordinate to violate existing regulations, instructions or technical guidance.

SV004 Authorized Unqualified Individuals for Task is a factor when an individual has not met the general training requirements for the job/weapon system and is considered noncurrent, but supervision/leadership allows the individual to perform the task.

SUPERVISORY VIOLATIONS

SV001
SV002
SV003
SV004

ORIGINA
LA MINA
MILITARI

PC 208 - communication issue PPI08 Failure
PC 307 - Fatigue effect
(C)

PC 315 - heat exhaustion

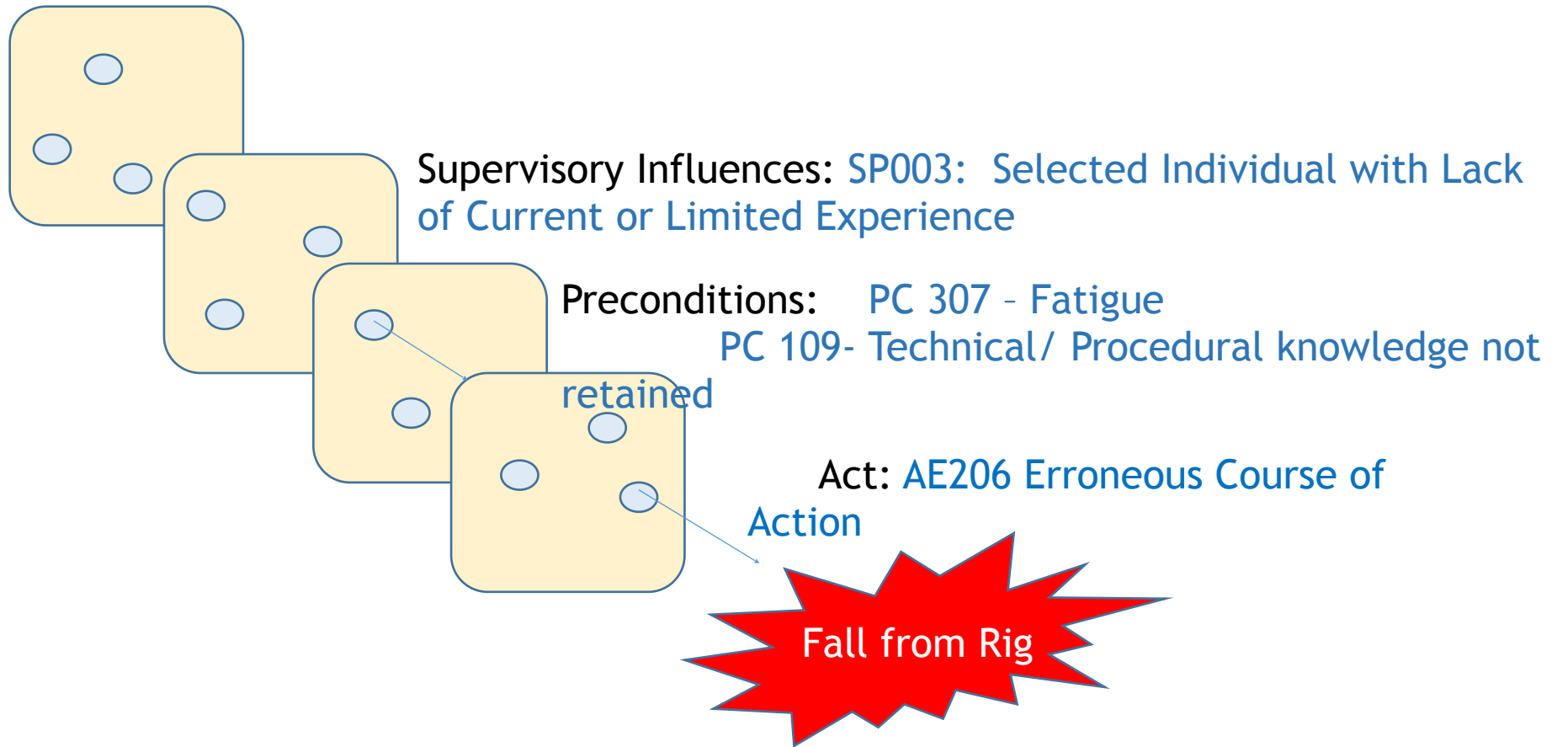
PC 504 - misperception of Δ ins environment

* PC 109 - Technical/procedural knowledge not retained

SP002 - Inappropriate Team Composition? SP01 - Directed to the

SP016 - Inadequate risk assessment/mitigation Beyond capabilities






Step 4: Identify Organizational Influences

ORGANIZATIONAL INFLUENCES
Upper-Level Management, Command Level

Organization
An organization is the communications, actions, omissions or policies of upper-level management that directly or indirectly affect supervisory practices, conditions or actions of the operators.



Resource Problems (OR000)

Resource Problems (OR000) are factors when resources influence system safety, resulting in inadequate error management or creating an unsafe situation.

Command and Control Resources Are Deficient	OR001
Inadequate Infrastructure	OR002
Failure to Remove Inadequate, Worn-out Equipment in a Timely Manner	OR005
Failure to Provide Adequate Operational Information Resources	OR004
Failure to Provide Adequate Funding	OR000

RESOURCE PROBLEMS

Upper-level management, command level

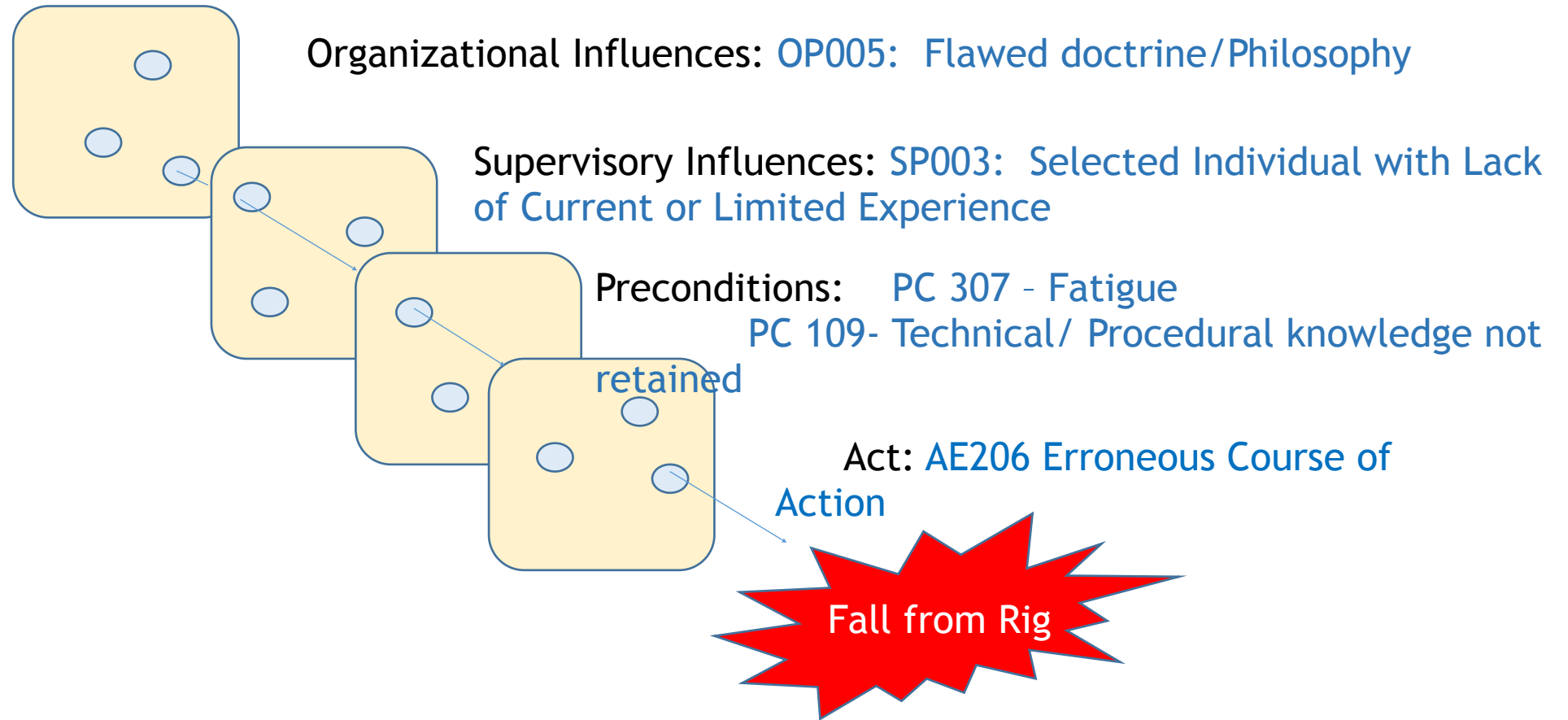
PC 208 - communication issue PP108 Failure
PC 307 - Fatigue effect
PC 315 - heat exhaustion (C)
PC 504 - misperception of Δms environment
* PC 109 - Technical/procedural knowledge not retained
SP02 - Inappropriate Team Composition? SP01 - Directed task
SP05 - Inadequate risk assessment/mitigation Beyond capabilities
CP 005 - Flawed doctrine/philosophy







EAGLE Mishap



Step 5: Recommendations for Improvement

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Remind personnel that they can stop at the trees or tops platforms to rest if fatigued while climbing.

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Determine feasibility/need to conduct a physical fitness test before allowing personnel/guests to climb the rigging- or not allow TDY personnel or guests to climb higher than the tops platform.

Step 5: Recommendations for Improvement

- Remind personnel that they can stop at the trees or tops platforms to rest if fatigued while climbing.
- Determine feasibility/need to conduct a physical fitness test before allowing personnel/guests to climb the rigging- or not allow TDY personnel or guests to climb higher than the tops platform.

When announcing emergency sail stations, also include a description of the situation.

Step 5: Recommendations for Improvement

- Remind personnel that they can stop at the trees or tops platforms to rest if fatigued while climbing.
- Determine feasibility/need to conduct a physical fitness test before allowing personnel/guests to climb the rigging- or not allow TDY personnel or guests to climb higher than the tops platform.
- When piping emergency sail stations, also include a description of the situation.

Research safety measures that other sail training vessels have put into place to locate a fallen climber in the water.

Resolution







MEDEVAC

Stephan Kramer (Rood boven
Groen)

Arjen Mintjes (Maritime Academy
Holland)



Facts 2016 : Medevac Christian Radich by helicopter; lessons learned;

Facts 2017: Medevac Regina Maris by cruise liner and helicopter;



Medicine consumption

- Vorbereit. Mann.
- Schmerzmittel 50
 - Infusionslösungen 1000ml
 - Azung wnl. + Packung. → 1 ~~Chloroform~~
 - Spritzen 5ml 50
 - Spritze 2ml 10
 - Ringel 500ml 12 → 20kg auto voor min
 - NaCl 500ml 2 → 1/2 Liter aan
 - Paracetamol 500mg 2 doses per board.
 - Paracetamol 100mg 3 Stuks
 - Diclofenac 75mg 2 doses per
 - Metformine 500mg 4 Stuks.
 - Clofazimine 750mg 3x6 = 18
 - Arginine 1200mg 3x5 = 15
 - Metformine 500mg 3x6 = 18
 - Aspirin 825/125 tabl. 4
 - Pseudoephedrine (Medipend) 120mg 2 doses per
 - Metoclopramide 10mg 4 Stuks
 - Domperidon 10mg 10 Stuks
 - Codeïne 10mg 5 Stuks.
 - Infusieset 10
 - Plaster ✓
 - Groom ✓

MS Professor Logachev first response



SV Royal Clipper second response



Ocean view



Medical center Royal Clipper



Helicopter evacuation





Movie







Lessons learned

- share your knowledge
- communication is vital
- ocean crossing = experienced doctor on board
- amount of basic medicines
- what to take with you when evacuated





Lessons learned

- Media information
- Before evacuation RISC assessment
- Use of videos for training purposes

Questions



