European Safety Promotion Network Rotorcraft

TO SERVE THE COMMUNITY

European Safety Promotion Network Rotorcraft (ESPN-R)

Safety Workshop

helitech® international
HELICOPTER EXPO & CONFERENCE
16-18 OCT 2018 AMSTERDAM RAI

In association with
EHA
EUROPEAN HELICOPTER ASSOCIATION

SMS Case Study

Presented by:
Dr Ilias Panagopoulos

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Safety Management System (SMS) at a glance

10 Critical Slides

ICAO SMS Reference material:

https://www.unitingaviation.com/publications/safetymanagementimplementation/content/#/?_k=lbllsw

‘Safety’: Definition

Safety is the state in which **risks** associated with aviation activities, related to, or in direct support of the operation of aircraft, are **reduced and controlled to an acceptable level.**

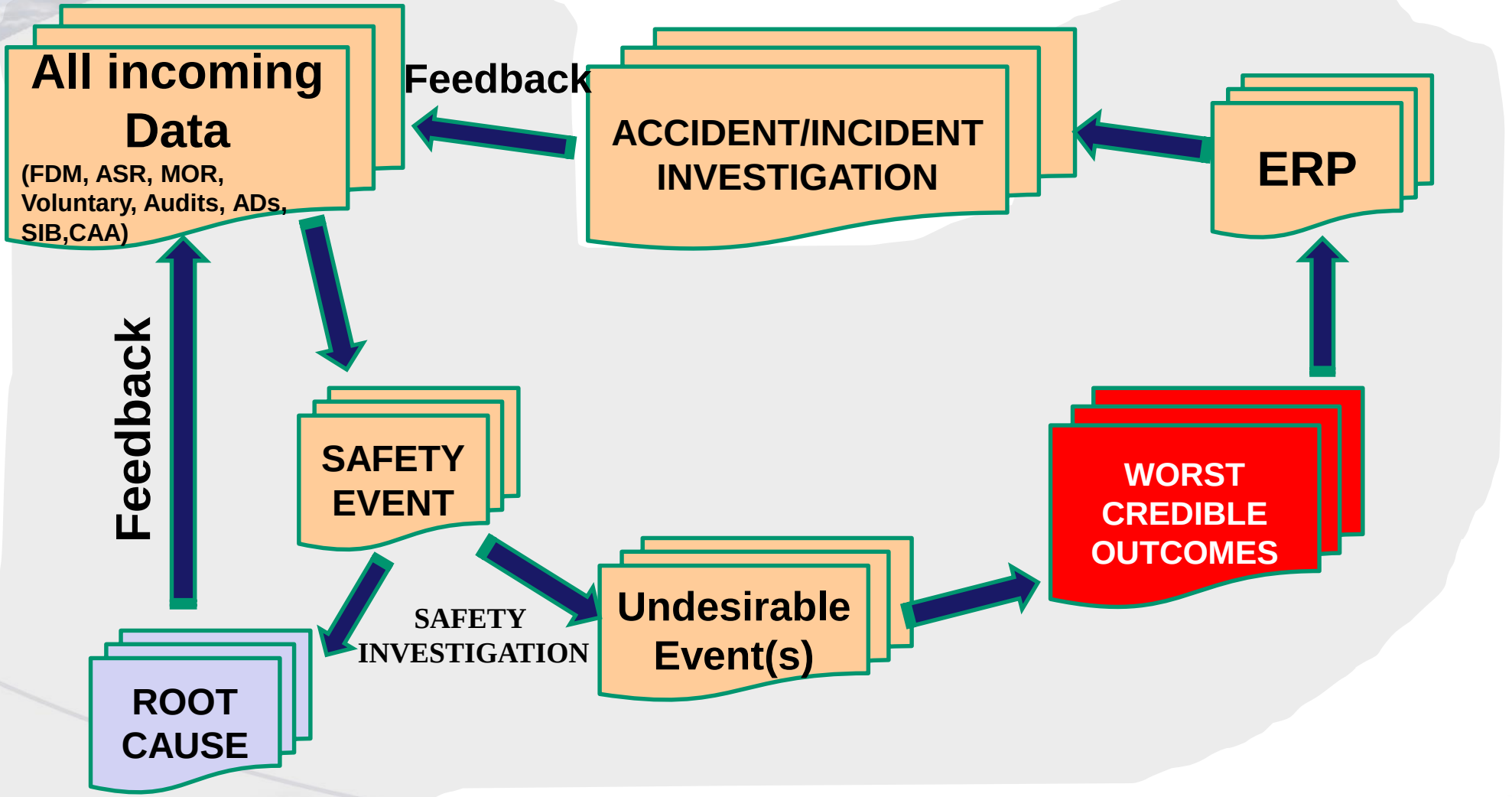
(ICAO ANNEX 19, published 14 Nov 2013*)

If there should be any differences in the definitions, the Annex 19 definitions shall prevail

ICAO SMS Framework

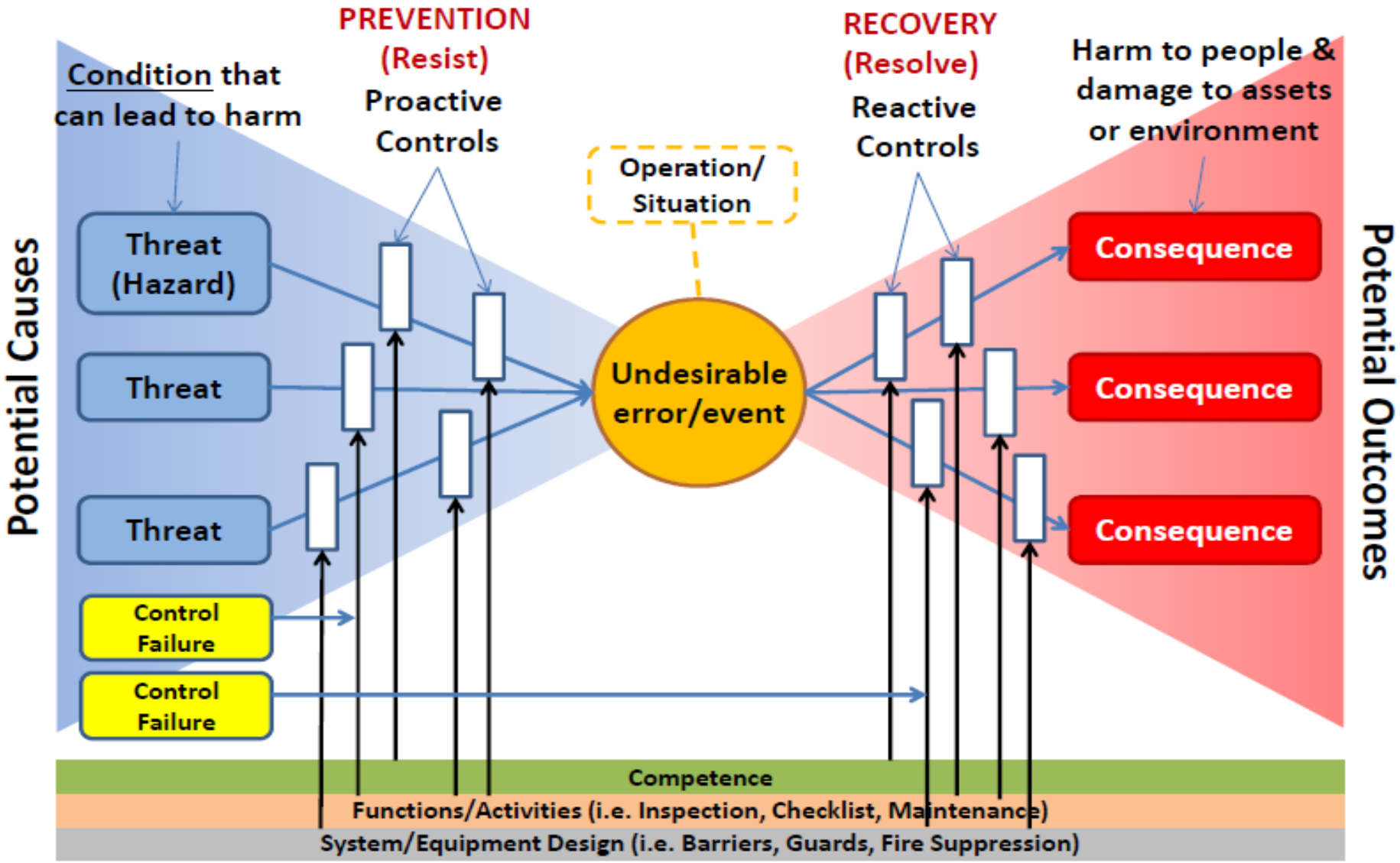
SMS Main Components	
1	Safety Policy and Objectives
2	Safety Risk Management
3	Safety Assurance
4	Safety Promotion

The safety management process: The Big Picture

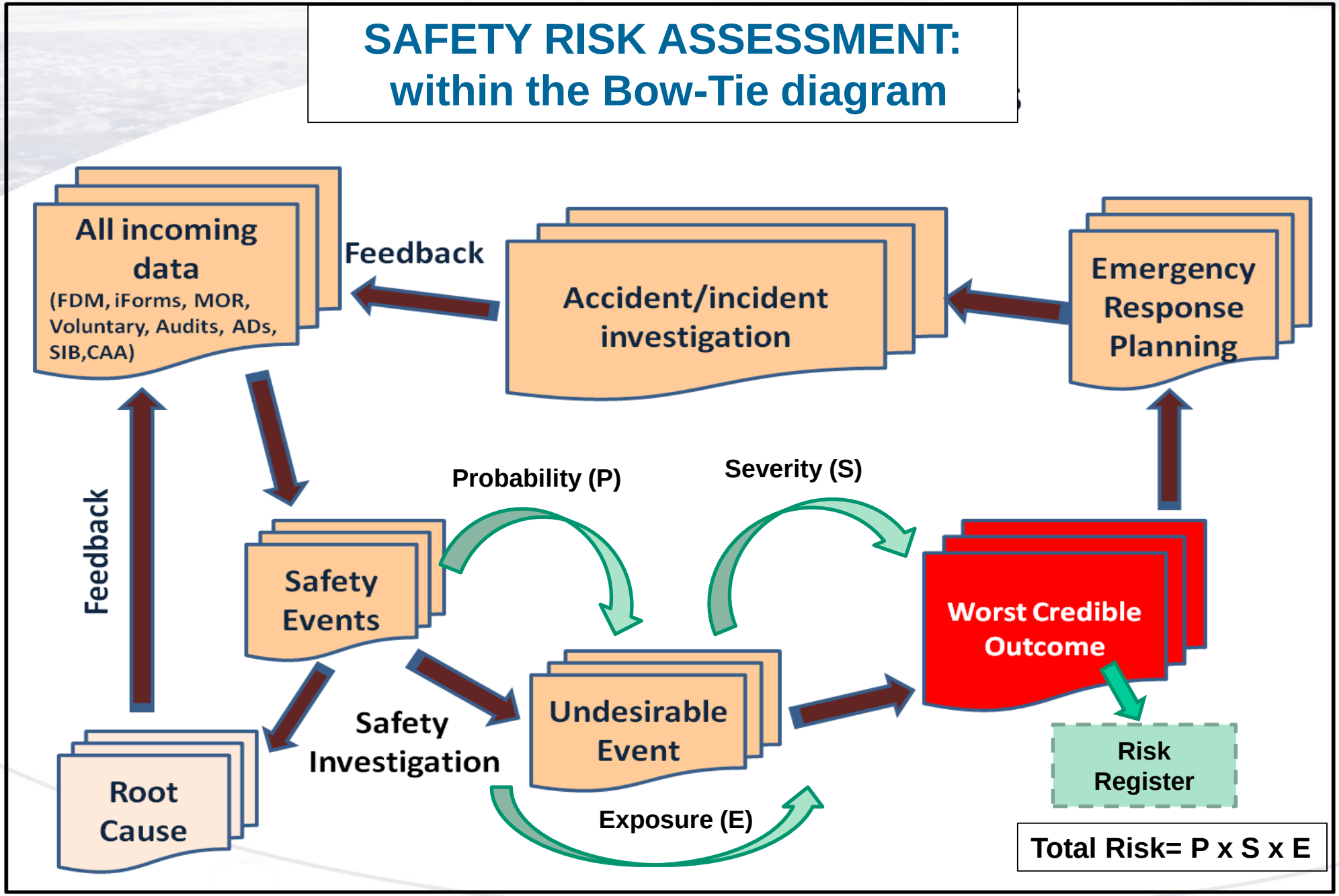


Hazard Identification

Understanding Risk: The Bow Tie Model



SAFETY RISK ASSESSMENT: within the Bow-Tie diagram



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The results of the Integrated Risk Management (IRM) Common Risk Register or Hazard Log Safety Action Group (SAG) level

Control ID	Risk Owner	Occurrence, hazard or concern	Undesirable Event	Worst Credible Outcome	P	S	E	Initial Risk	Risk Validation	Mitigations	Authorization of Operation	Residual Risk	Risk Actionee(s)	Actual (current) risk state	Last update	Comment -Timeline
OPS_001	Safety Manager	Engine Failure	Auto-rotation	Ditching, post crash fire, injuries, fatalities, crash	H	H	M	High	Chief Pilot	Inform Aircrew, pax, Training, SIM, SOP, QRH	Accountable Manager (AM)	Medium	FLT OPS, Mx, CAMO	High	15 Oct 2018	2 events, not in the company but in the world - wide fleet
AW_003								High				Low		Medium		
GND_007								Medium				Low		Medium		
ATM_103								Medium				Low		Low		
HR_022								Medium				Eliminated		Low		
TRN_009								Medium				Low		Low		
OHS_014								Low				Low		Medium		
SEC_001								Low				Low		Low		
CM_018								Low				Eliminated		Eliminated		

Risks are reduced to an Acceptable Level

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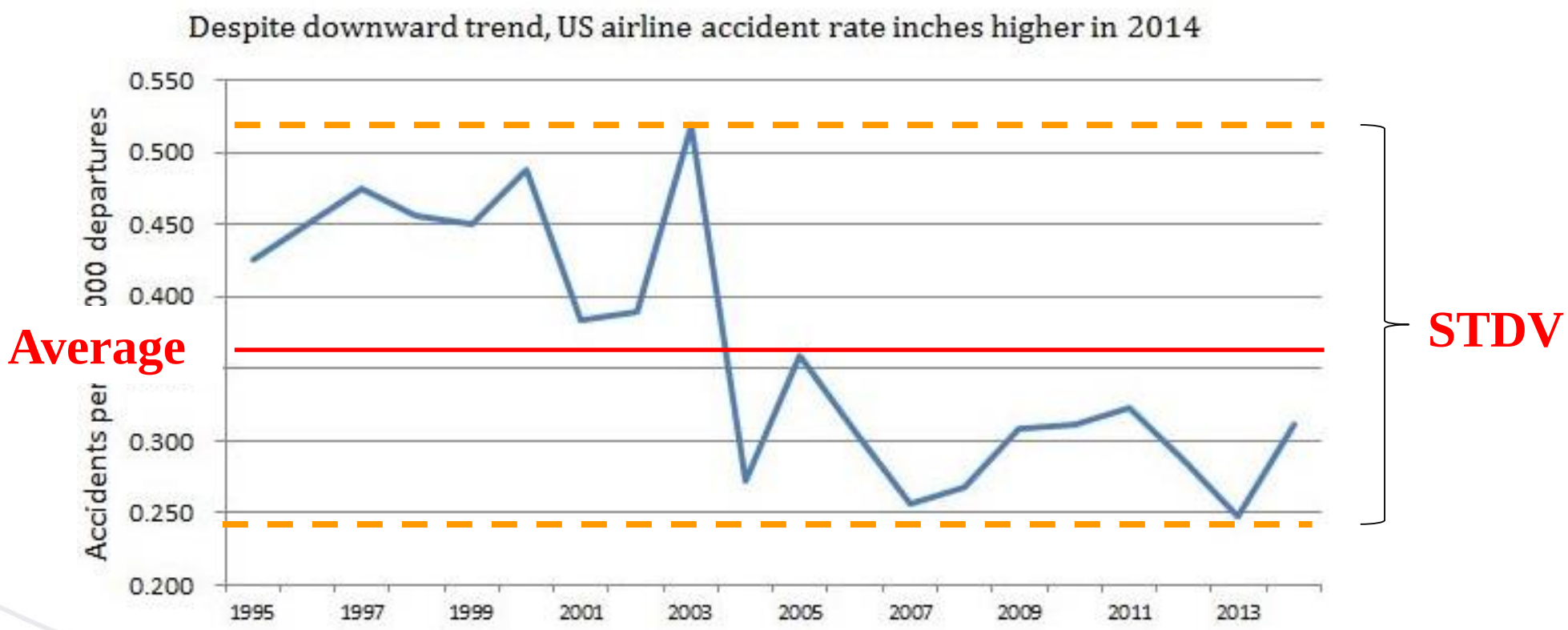
Control:
Average and Standard Deviation (STDV)



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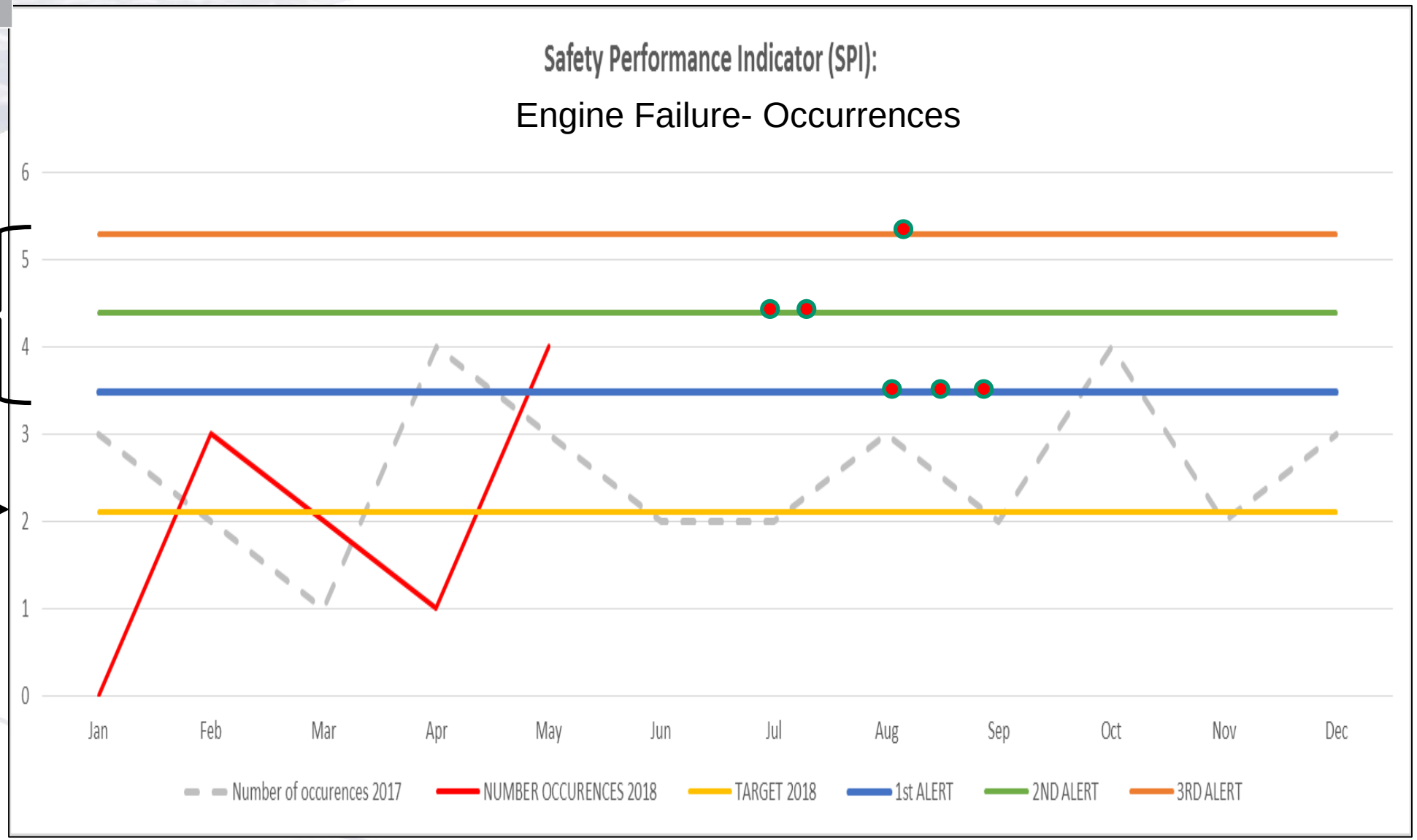
Risks are Controlled to an Acceptable Level

ALERT Levels

TGT



EU/EASA Hard and Soft Law

Applicable to all Member States	Adopted by	Status
Regulations of the European Parliament and the Council Example: EC 1136/2018, 1321/2014, EC 965/2012	The European Parliament and Council	Legally binding SHALL
Implementing Rules (IR) Examples: PART ORO, PART-M, PART-145, PART-147/66	European Commission	Legally binding SHALL
Certification Specifications (CS) Acceptable Means of Compliance (AMC) Guidance Materials (GM)	EASA	Not legally binding SHOULD

Liabilities & Legal Responsibilities

This is the reason why EASA introduced the 'Compliance Monitoring (CM) function' next to SMS requirements and calls this integration of SMS+CM as 'Management System'

EASA Management System Assessment Tool: https://www.easa.europa.eu/sites/default/files/dfu/214081_EASA_MANAGEMENT_SYSTEM_ASSESSMENT_TOOL.pdf

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SMS Case Study 1

Tailwind Approach to helipad

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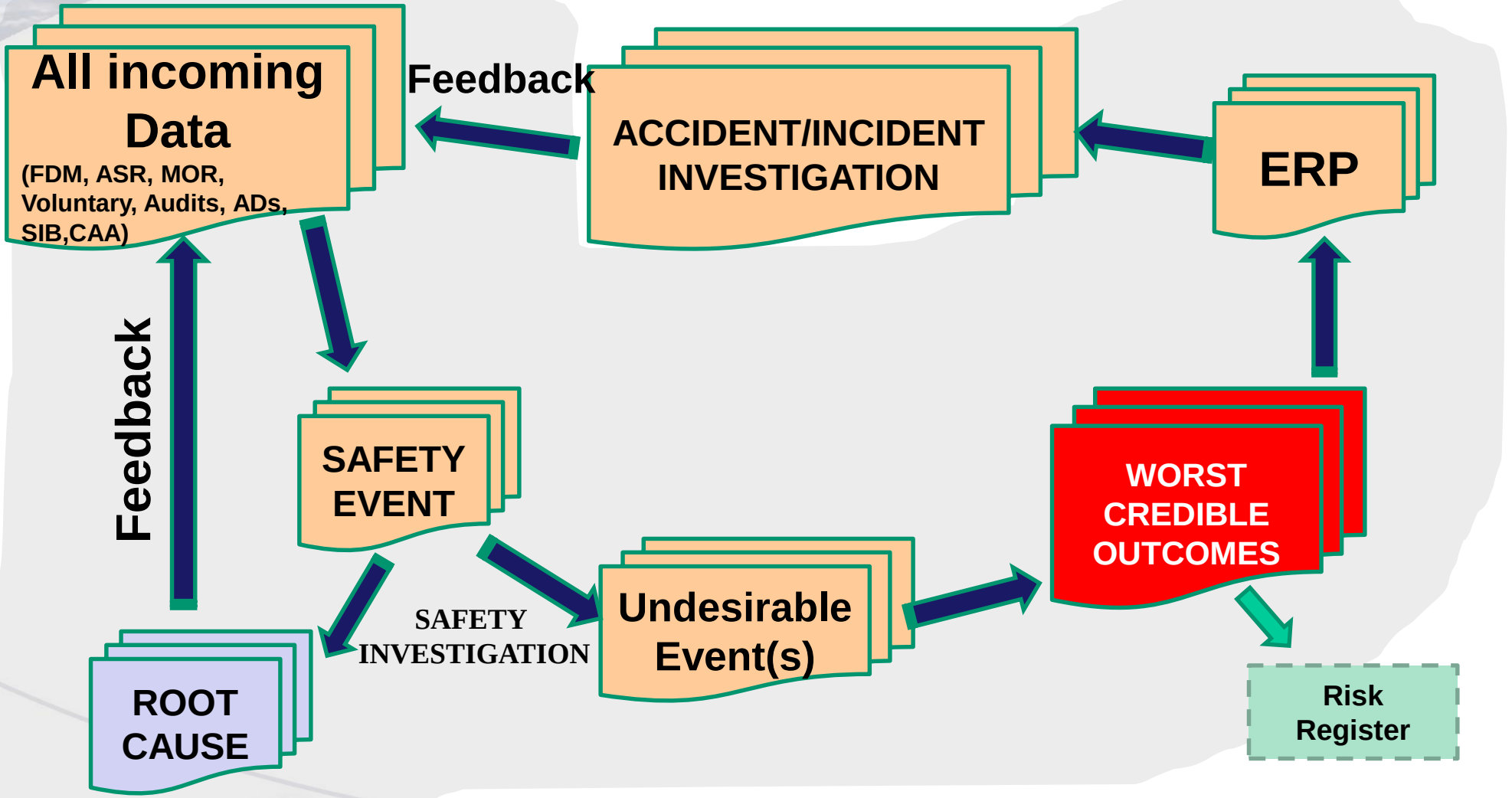
The safety management process: The Big Picture



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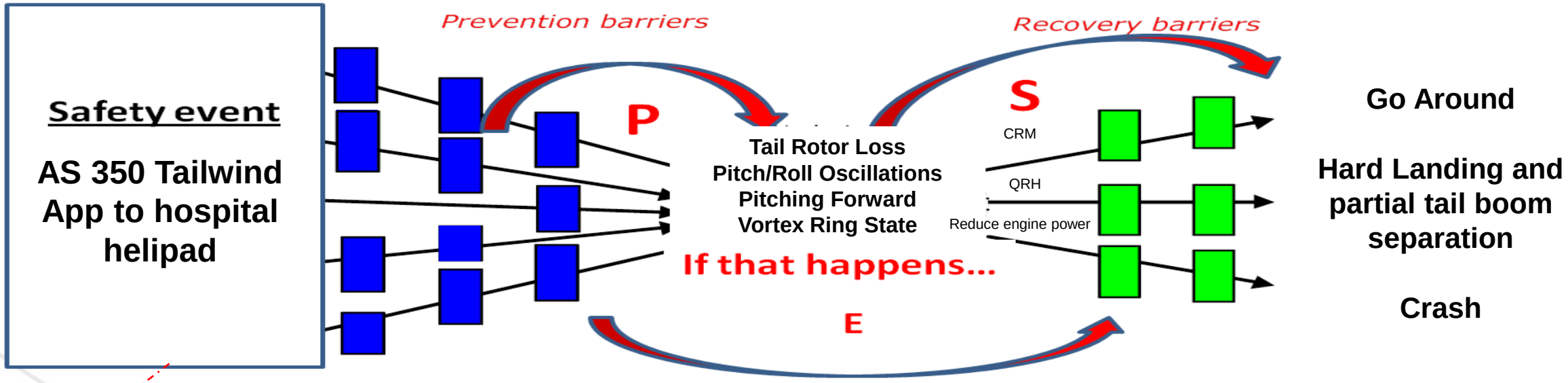
BOW-TIE Risk Management methodology



Root Causes:
Power lines in the vicinity
Wind 11-16 gust from 120^0

TOTAL RISK = P x S x E

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The results of the Integrated Risk Management (IRM)
Common Risk Register or Hazard Log
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OPS_002	Chief Pilot	Tailwind App	Tail Rotor loss, pitch/roll oscillations, Vortex Ring State (VRS)	Go Around, Hard landing, Crash	H	H	M	High	Director of OPS	Inform Aircrew, Reduce engine power, CRM, Training F/S	Accountable Manager (AM)	Low	Chief Pilot, Head of Training	Medium	11 Oct 2018	

Risks are reduced to an Acceptable Level

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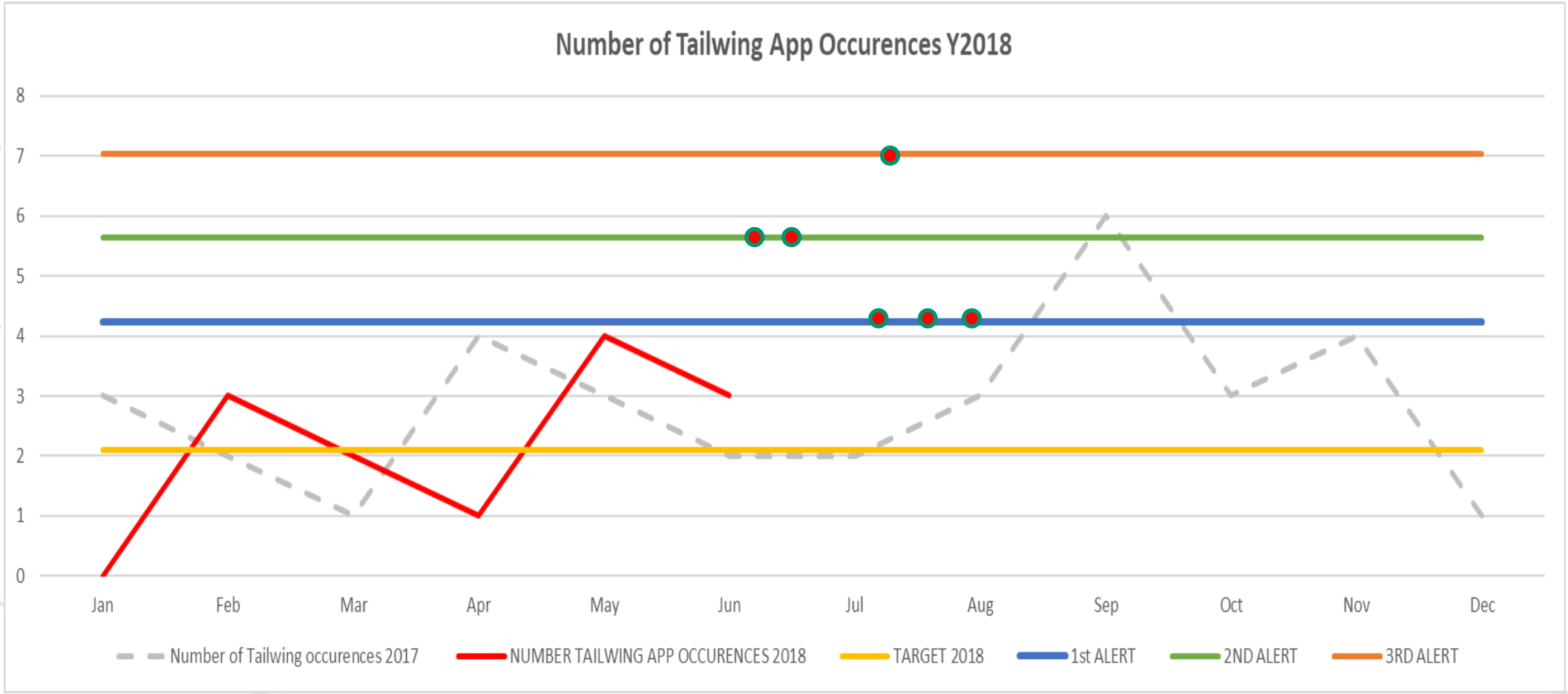
Risks are Controlled to an Acceptable Level

Tailwind App Occurrences

ALERT Levels

TGT →



Emergency Response Plan (ERP)

What if the Air Operator will be involved in an AS-350 serious incident or accident as a result of a tail-wind approach?

How the Air Operator should respond in a situation like this in an effort to ‘Minimize the Damage’
(i.e. to the People, Assets, Reputation, Finance)?

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SMS Case Study 2

Failure of Tail Rotor Blade

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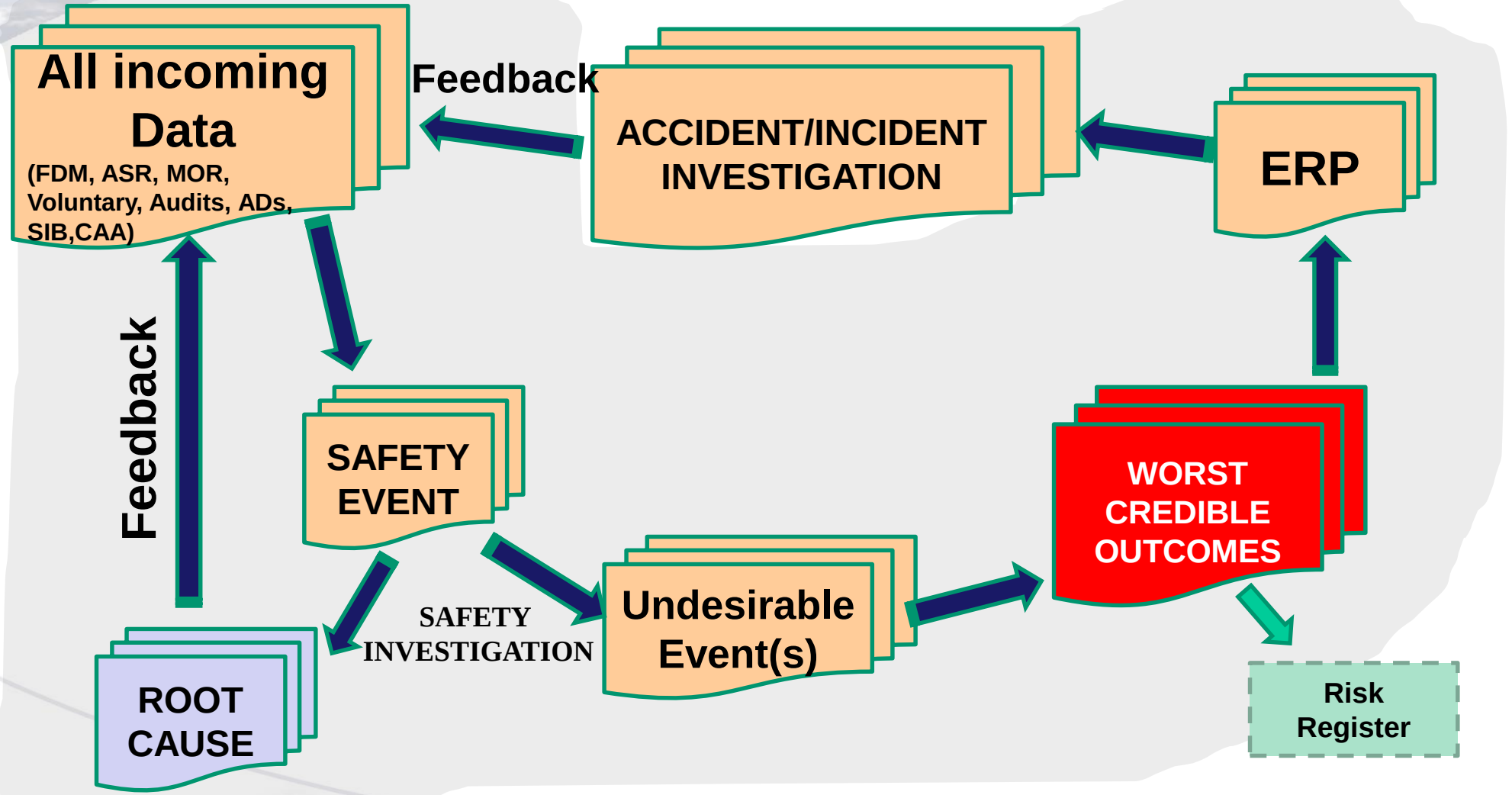
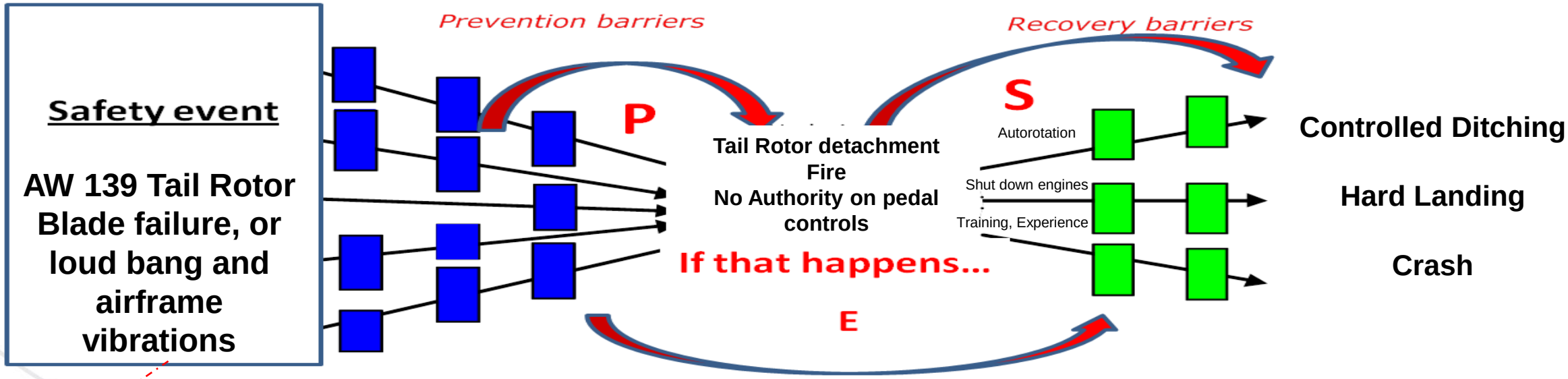


BOW-TIE Risk Management methodology



Root Causes:
Design issues
Defects
Production discrepancies
Torsion box thickness reduction

TOTAL RISK = P x S x E

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The results of the Integrated Risk Management (IRM) Common Risk Register or Hazard Log Safety Action Group (SAG) level

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OPS_002	Chief Pilot	Tailwind App	Tail Rotor loss, pitch/roll oscillations, Vortex Ring State (VRS)	Go Around, Hard landing, Crash	H	H	M	High	Director of OPS	Inform Aircrew, Reduce engine power, CRM, Training F/S	Accountable Manager (AM)	Low	Chief Pilot, Head of Training Safety Manager	Medium	11 Oct 2018	
AW_007	CAMO Manager	Tail Rotor Blade failure, or loud bang and airframe vibrations	Tail Rotor detachment Fire No Authority on pedal controls	Controlled Ditching Hard Landing Crash	M	H	L	Medium	CAMO Manager	Inform Aircrew, Reinforce inspections, Consult manufacturer CRM, Training F/S	Director of OPS	Low	CAM Chief Pilot Head of Training Safety Manager	Medium	16 Oct 2018	Re-occurrence

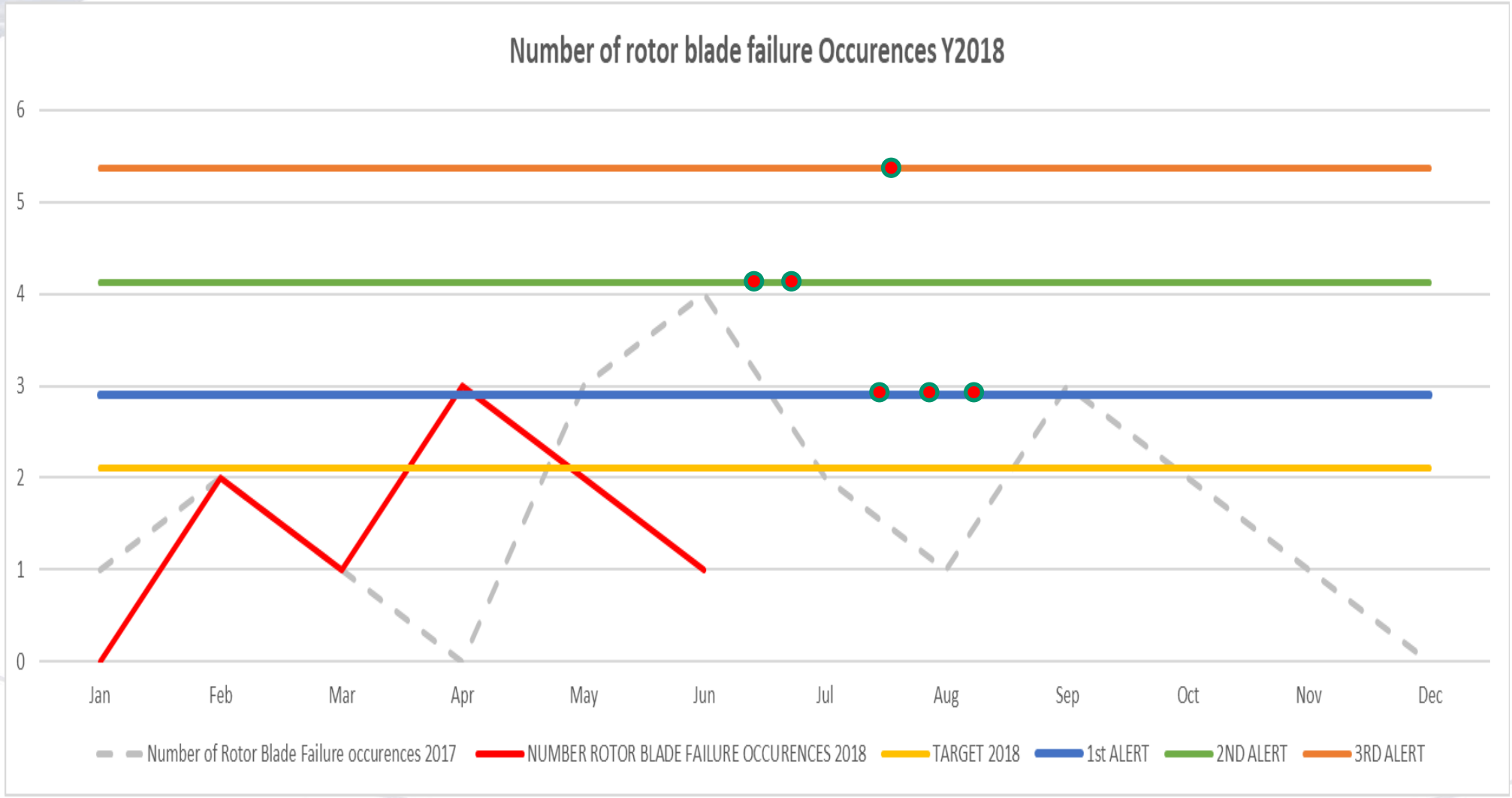
Risks are reduced to an Acceptable Level

Risks are Controlled to an Acceptable Level

Rotor Blade failure, or loud bang and airframe vibrations Occurrences

ALERT Levels

TGT →



Emergency Response Plan (ERP)

What if the Air Operator will experience a serious incident or accident as a result of AW-139 tail rotor blade failure?

How the Air Operator should respond in a situation like this in an effort to ‘Minimize the Damage’ (i.e. to the People, Assets, Reputation, Finance)?

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Thank you!