UNITED STATES HEMS SAFETY
PAST, PRESENT AND FUTURE

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BELL

Always prepared for but never expected

Agenda

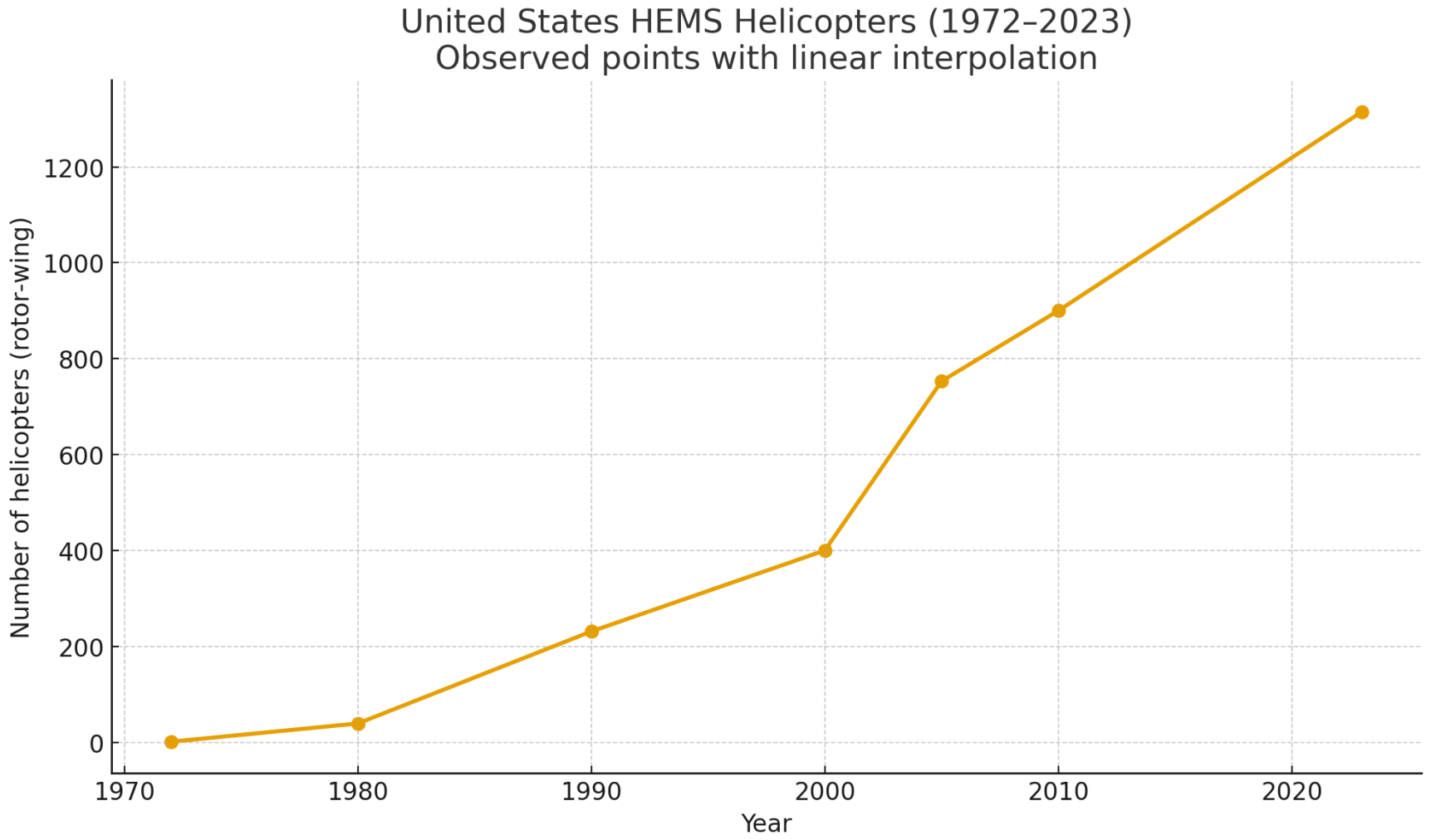
- Introduction
- Discussion of Global HEMS Market
- History of HEMS in The U.S.
- Accidents in U.S. HEMS
- FAA Recommendations and Implementation
- International Helicopter Safety Foundation Survey
- Future Steps
- Q & A

HISTORY OF HEMS IN THE UNITED STATES

History

- The first hospital- based civilian HEMS aircraft was established in 1972
- By 1980 Approximately 40 medical helicopters operating in the U.S.
- Concerns are raised regarding safety after 14 accidents
- In 1987 FAA conducts a 60-day review of medical helicopter safety nationwide.

US Helicopter EMS Growth



History…

- **In 1988 NTSB releases study of medical helicopter safety, investigating 59 HEMS accidents between May 1978 and December 1986.**
  - 19 recommendations by the FAA to improve safety, which addressed equipment, training, crew resource management, decision-making, flight-following procedures, weather minimums, and the development of safety programs for HEMS flights

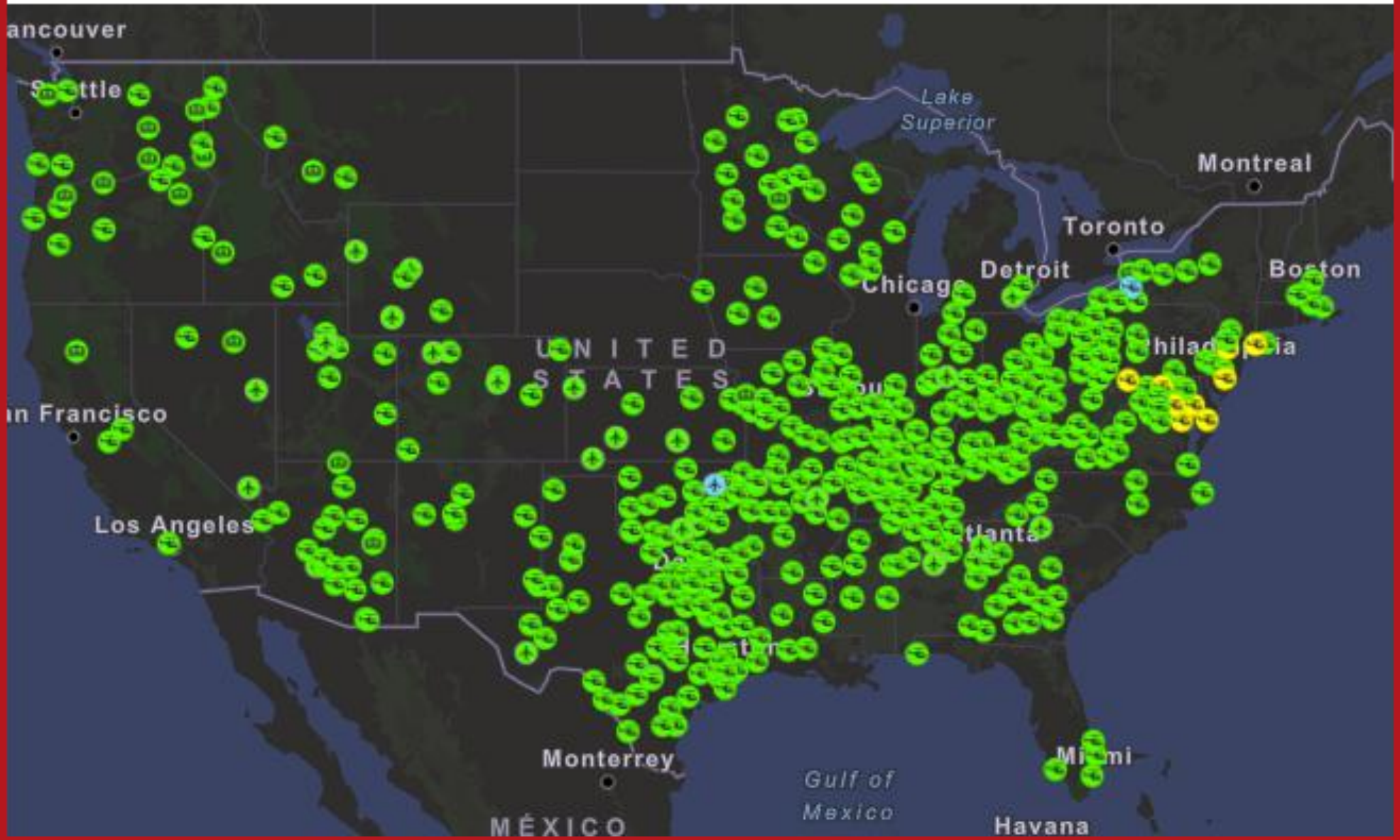
History…

- **1994 – An FAA study showed that night vision goggles can improve safety**
- **2000 – Nearly 800 medical helicopters operate in the U.S.**
  - The FAA and the HEMS industry hold an emergency safety summit after a rise in fatal accidents
  - Between 1990-1999, there were a reported 42 medical helicopter crashes with 42 fatalities and 32 serious injuries.

History…

- **2002 – Medicare introduces a new fee schedule, increasing payments for medical helicopters by 434%.**
  - This upgrade in revenue did not lead to an upgrade in medical and aviation capabilities as expected.
  - It led to uncontrolled growth in the number of medical helicopters (800 in 2000 to over 1500 in 2014).

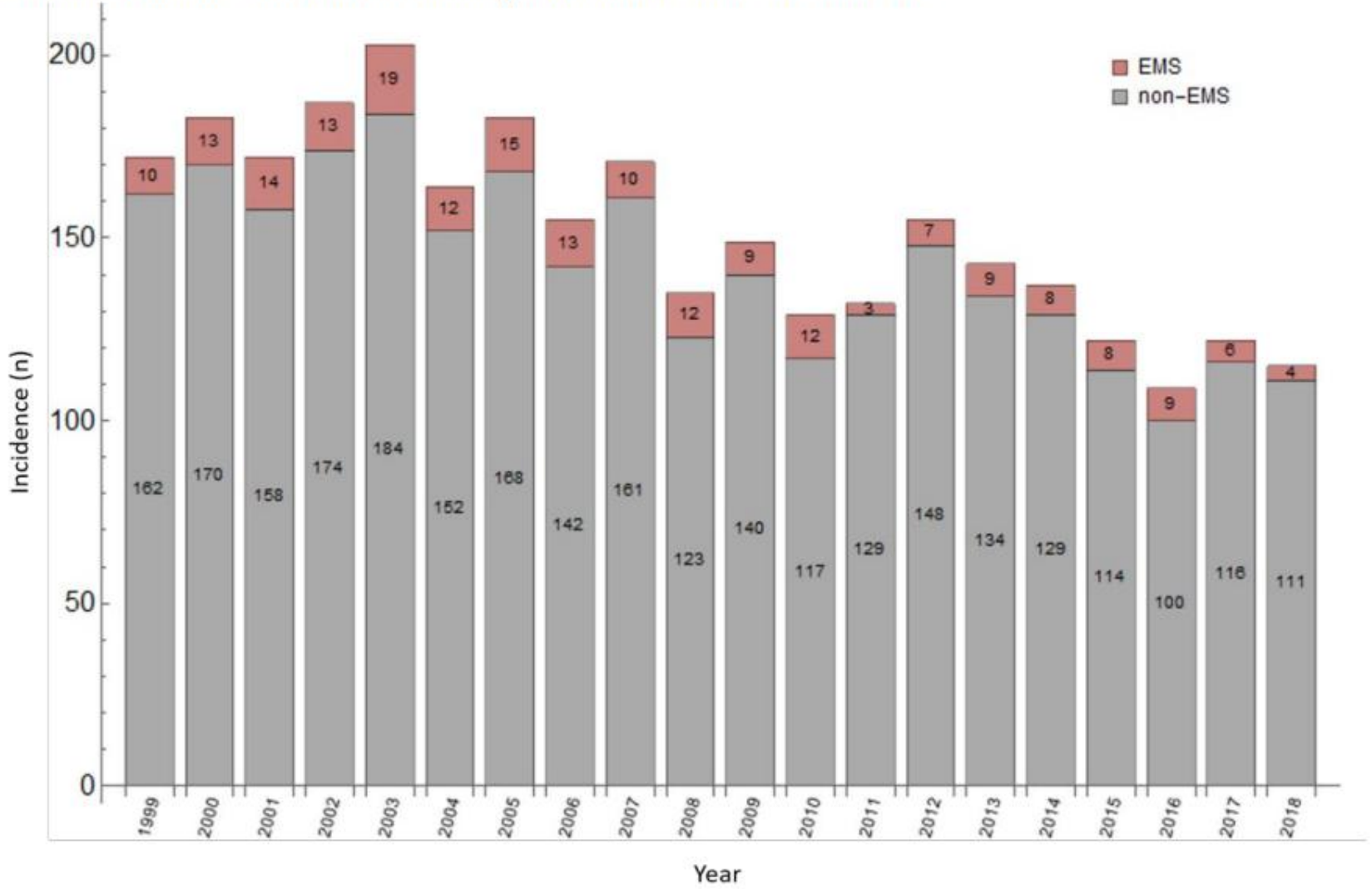
US Air Medical Bases



Accidents 1999 - 2018

Figure 1

Yearly Counts of All EMS and Non-EMS Helicopter Accidents From 1999 to 2018



* Although EMS counts for fatal helicopter accidents are much lower than those of non-EMS counts – confidence is shaken.

* Air medical operators had zero fatal accidents in 2020 and reduced the total accident rate to 0.76 per 100,000 hours flown from 2.22 per 100 thousand hours in 2019.

NTSB Report 2019

- **The National Transportation and Safety Board study that examined more than 3,000 EMS and non-EMS helicopter accident records covering 20 years beginning in 1999.**
  - Two prevalent factors that determined EMS accident fatality:
    - Visibility/darkness
    - Pilot decision making/judgment

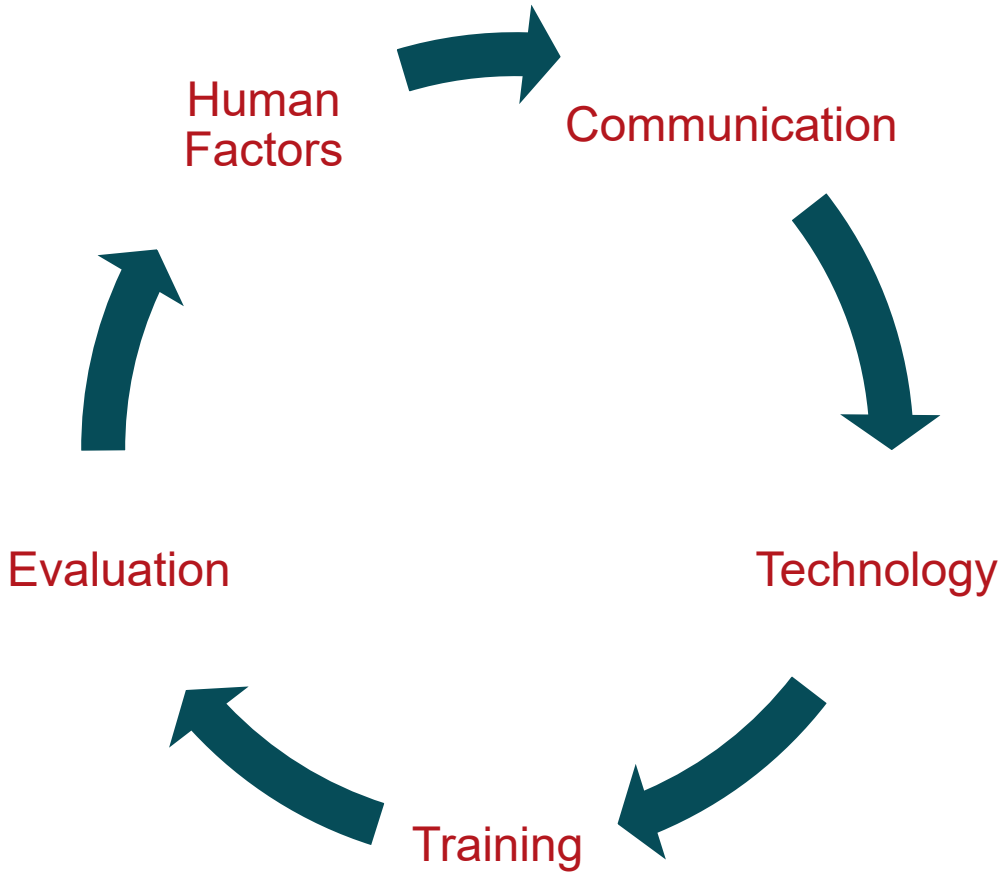
ESTABLISHING A CULTURE OF SAFETY

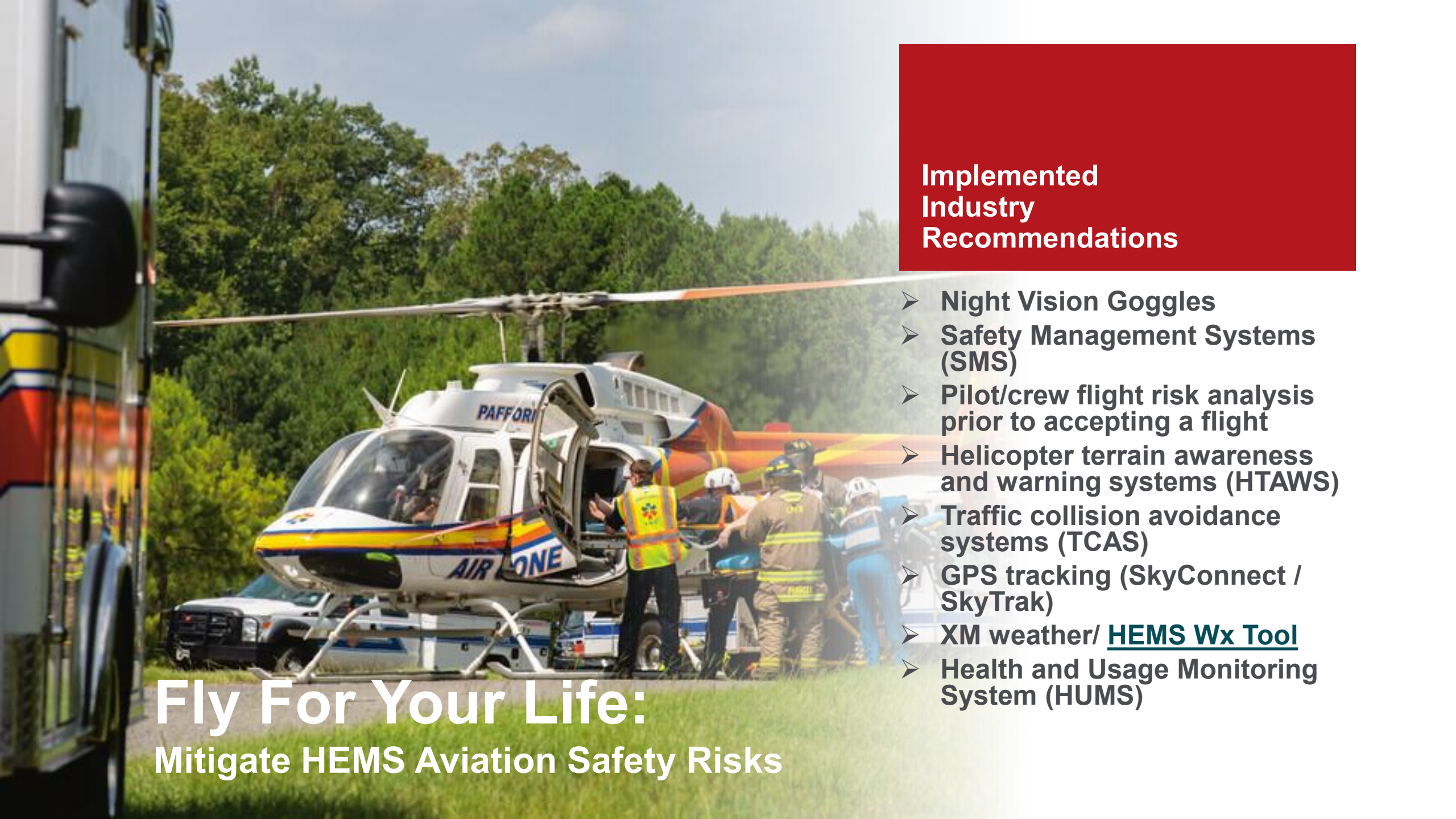
USHST
United States
Helicopter Safety Team

Why Focus on Safety?

- **HEMS operations pose more risks than other types of flying.**
  - Unscheduled flights into unfamiliar areas and semi-prepared landing surfaces ostensibly increase the chance of an accident or incident.

These Concerns Must be Addressed





Fly For Your Life:

Mitigate HEMS Aviation Safety Risks

Implemented Industry Recommendations

- Night Vision Goggles
- Safety Management Systems (SMS)
- Pilot/crew flight risk analysis prior to accepting a flight
- Helicopter terrain awareness and warning systems (HTAWS)
- Traffic collision avoidance systems (TCAS)
- GPS tracking (SkyConnect / SkyTrak)
- XM weather/ HEMS Wx Tool
- Health and Usage Monitoring System (HUMS)

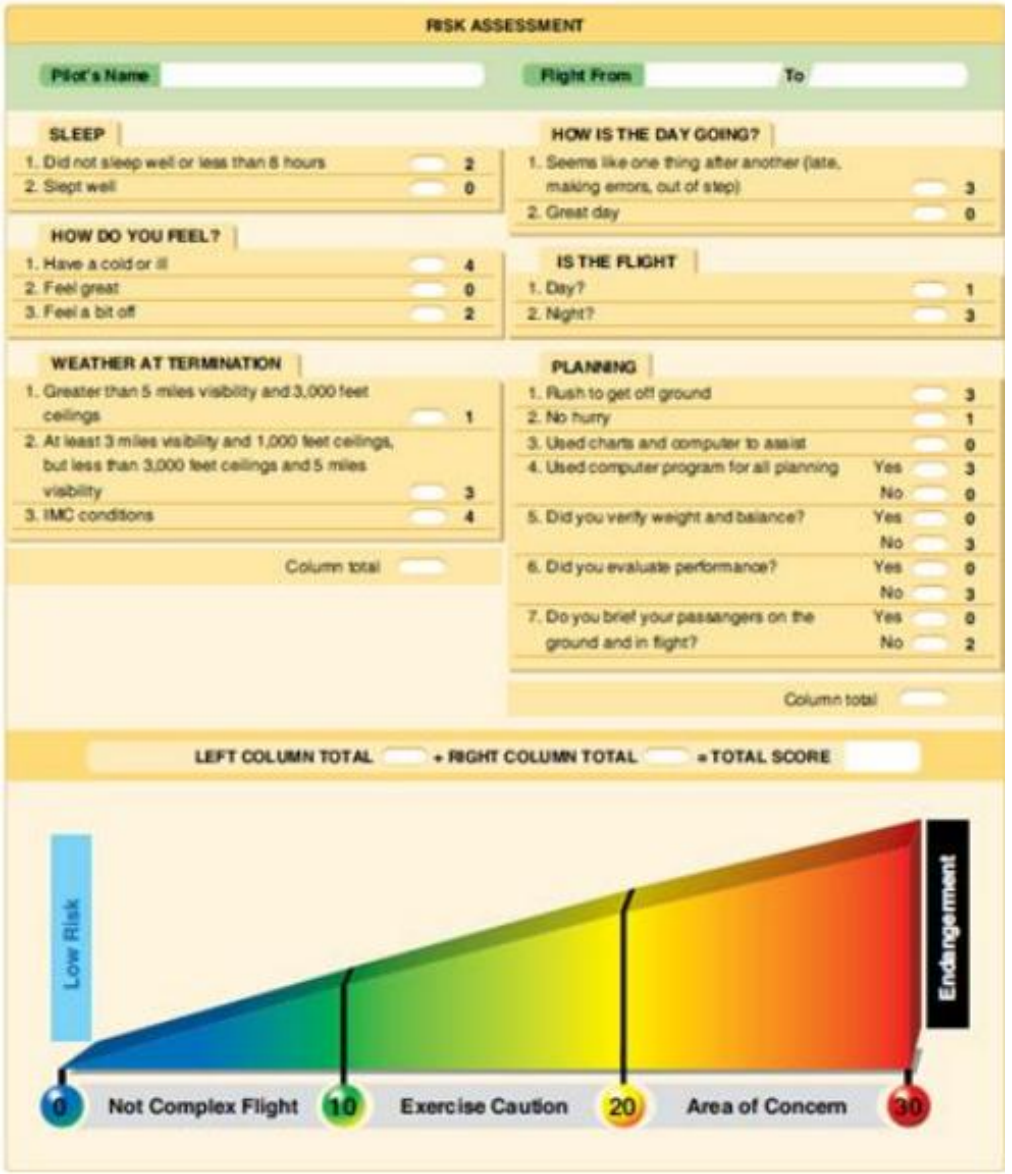
Safety Management System – the foundation

A SMS is simply a structured and systematic way of assuring that all significant risks have been identified and are being managed to a level as low as reasonably practicable.

The SMS should, among other things, assure that:

- The helicopter's maintenance is being carried out in accord with manufacturer's recommendations.
- The pilot is getting the appropriate check rides and training to assure ongoing competency.
- Pre-flight risk assessment is done before every flight.
- Just Culture- Root Cause Corrective Action on any event is done in a just and fair way (SMS does not exist w/o JC)

FAA Flight Risk Assessment Tool



RISK ASSESSMENT

Pilot's Name _____ Flight From _____ To _____

SLEEP

1. Did not sleep well or less than 6 hours	2
2. Slept well	0

HOW DO YOU FEEL?

1. Have a cold or ill	4
2. Feel great	0
3. Feel a bit off	2

WEATHER AT TERMINATION

1. Greater than 5 miles visibility and 3,000 feet ceilings	1
2. At least 3 miles visibility and 1,000 feet ceilings, but less than 3,000 feet ceilings and 5 miles visibility	3
3. IMC conditions	4

Column total _____

HOW IS THE DAY GOING?

1. Seems like one thing after another (late, making errors, out of step)	3
2. Great day	0

IS THE FLIGHT

1. Day?	1
2. Night?	3

PLANNING

1. Rush to get off ground		3
2. No hurry		1
3. Used charts and computer to assist		0
4. Used computer program for all planning	Yes	3
	No	0
5. Did you verify weight and balance?	Yes	0
	No	3
6. Did you evaluate performance?	Yes	0
	No	3
7. Do you brief your passengers on the ground and in flight?	Yes	0
	No	2

Column total _____

LEFT COLUMN TOTAL _____ + RIGHT COLUMN TOTAL _____ = TOTAL SCORE _____

2019 IHSF Survey (Currently VAST)

IHSF | International Helicopter Safety Foundation
Our Vision: An International Civil Helicopter Community with Zero Accidents

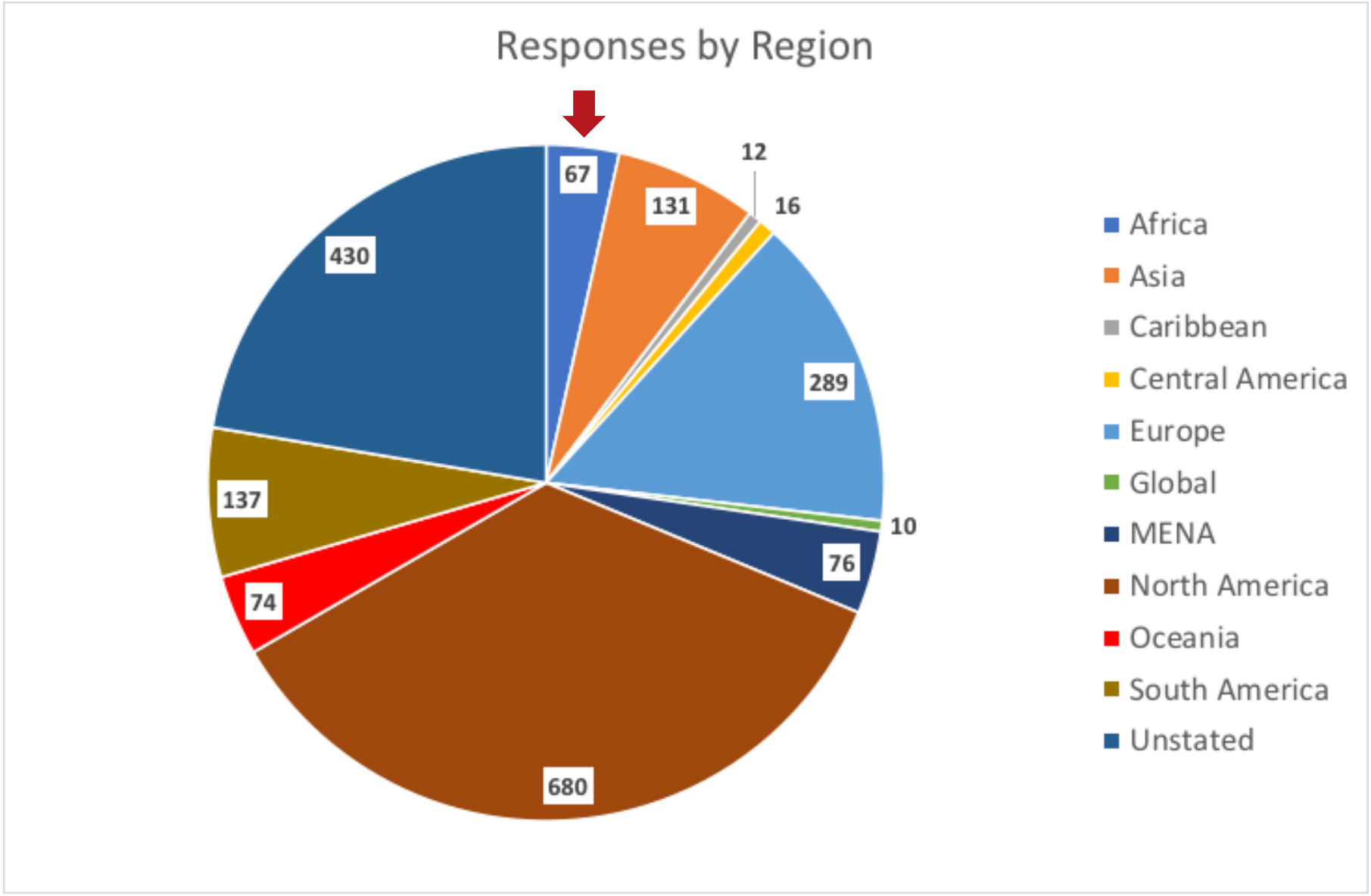
2019 Global Safety Survey Results

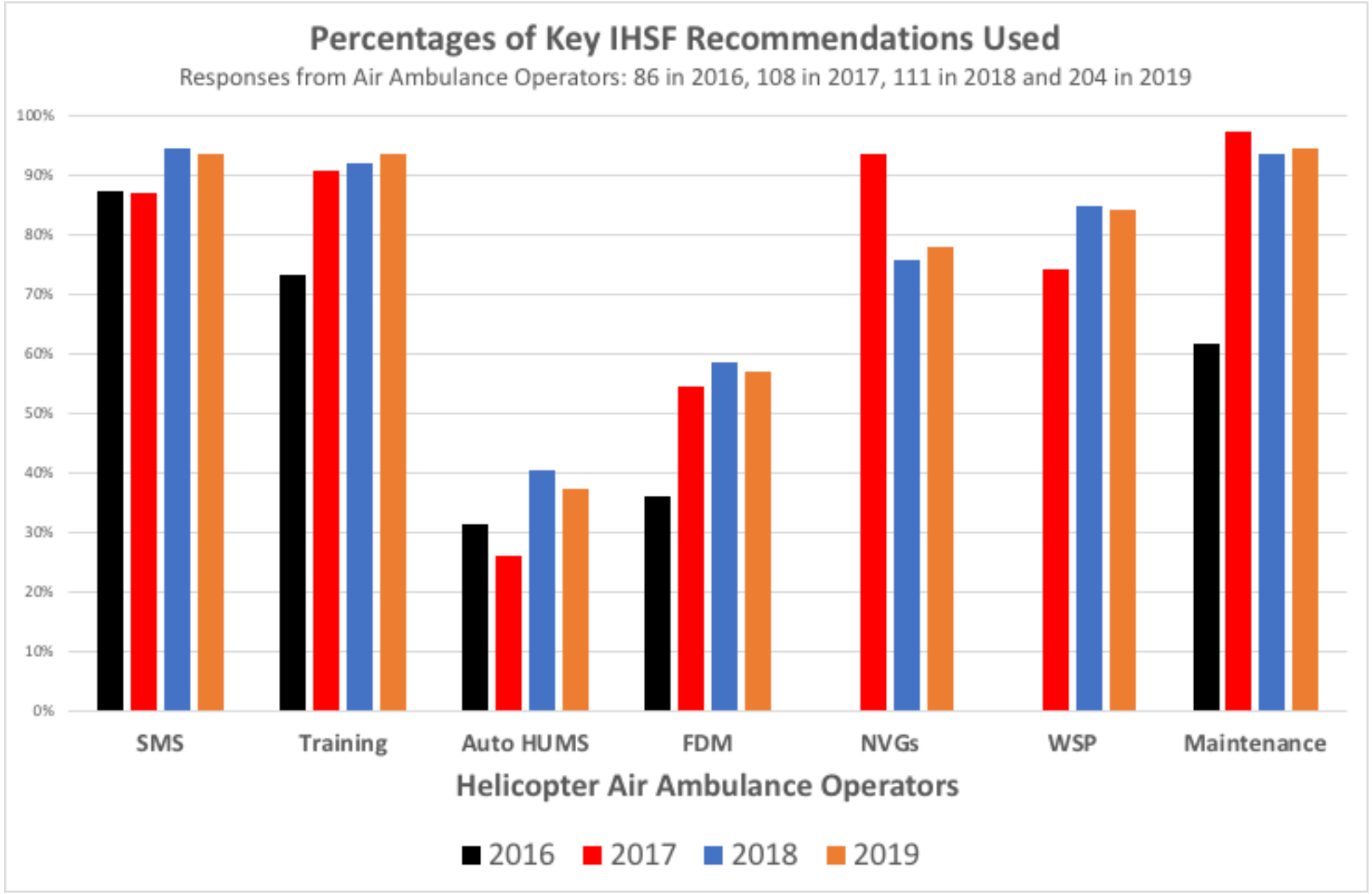
IHSF
International Helicopter Safety Foundation

Safety is Our 1st Priority

VAST
VERTICAL AVIATION SAFETY TEAM

Survey Responses

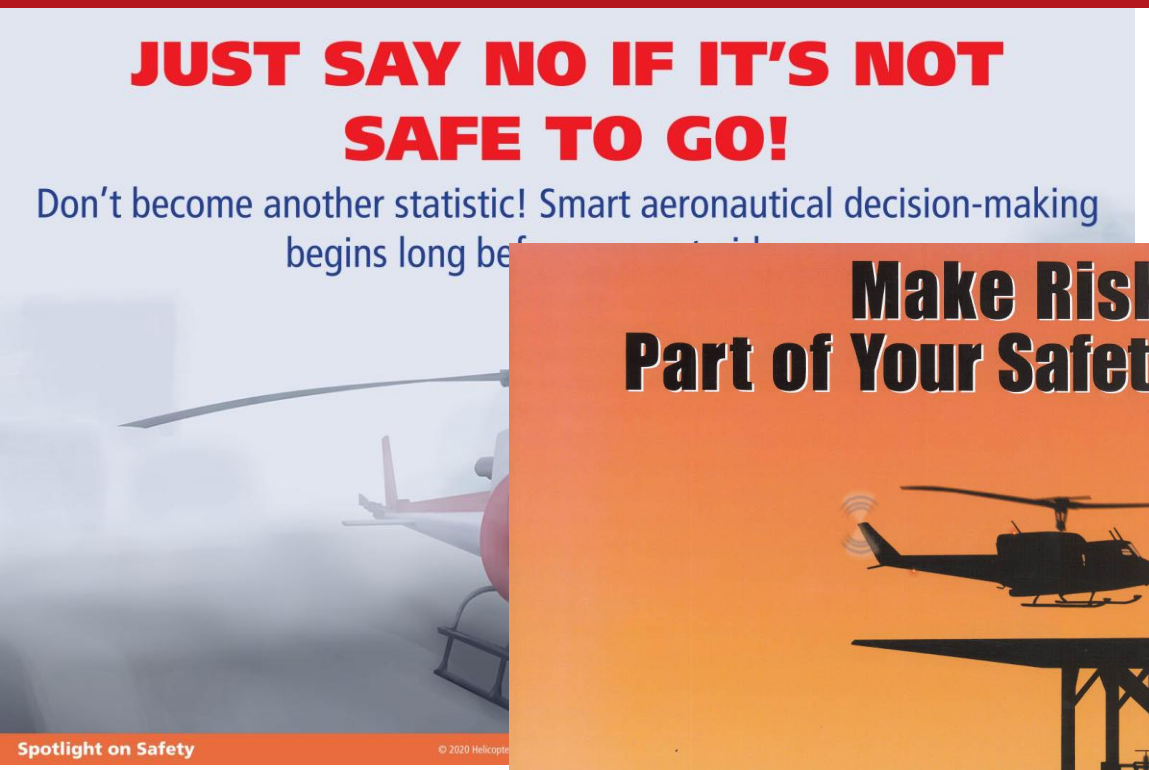


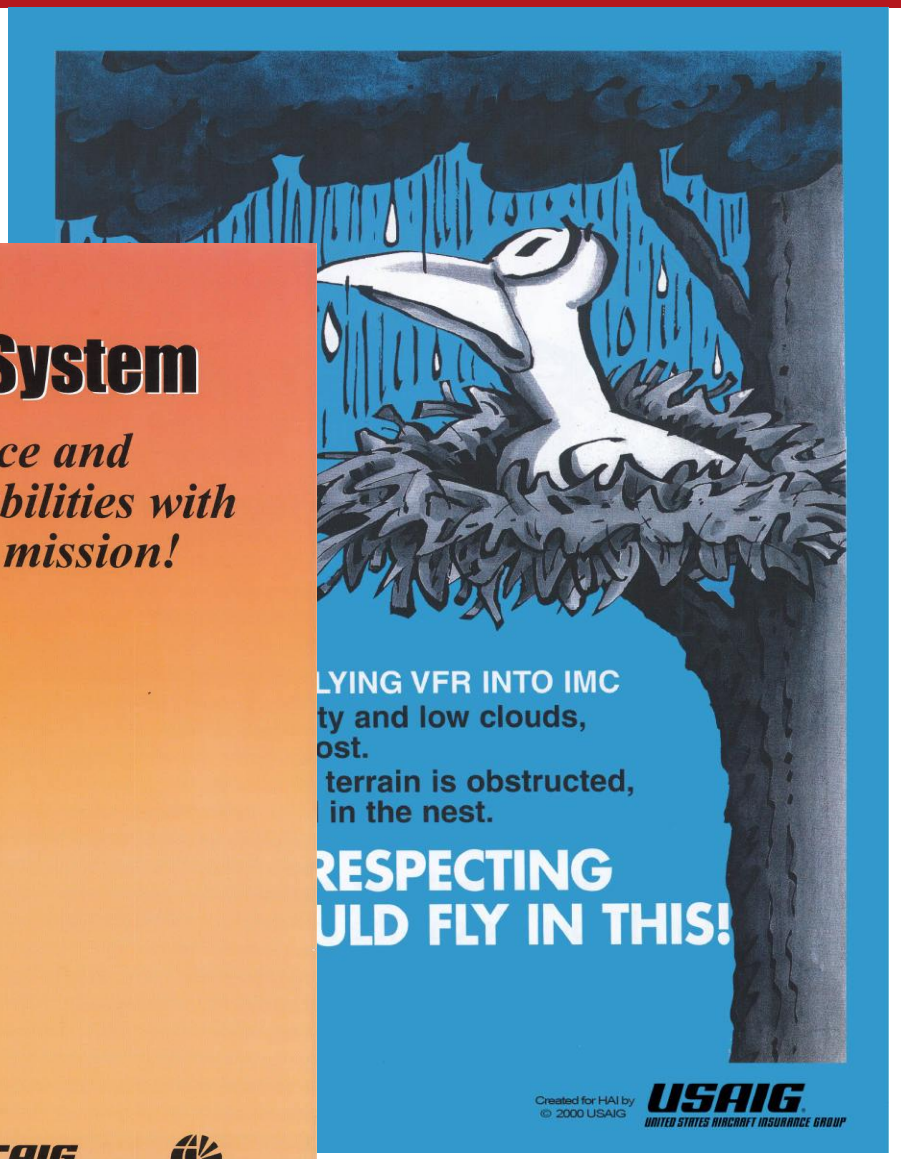

Percentages of Key IHSF Recommendations Used
Responses from Air Ambulance Operators: 86 in 2016, 108 in 2017, 111 in 2018 and 204 in 2019
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
SMS
Training
Auto HUMS
FDM
NVGs
WSP
Maintenance
Helicopter Air Ambulance Operators
2016
2017
2018
2019

What's Next?

- **New Equipment Mandates**
  - Any proposals to require installation of additional equipment must account for the space and weight constraints on rotorcraft & provide a clear safety benefit.
- **Air Ambulance Safety Data Collection**
  - FAA to improve reporting on the safety of helicopter air ambulance operations
- **Authorizing federal grants for rural weather reporting systems and integrating technologies to provide pilots current rural weather data**
- **Initiatives to address 5G interference with aviation critical safety equipment as well as assuring that future spectrum issues that affect aviation**

Future Steps





QUESTIONS?

Thank you!

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