

THE HUMAN EFFECTIVENESS DIRECTORATE

USAF Helicopter Mishap Data

By

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Statement of Accountability



This brief represents the position of the researcher. It does not represent the position of any other organization including the United States Air Force or the Department of Defense.

Cleared for public release by ASC Public Affairs.

Disposition Date: 18 Sep 2006

Document Number: AFRL-WS 06-2221





METHOD



- **Obtained all 359 USAF Rotary Wing Aircraft Mishaps from FY 93 to FY 05 from the AVSAS Data Base on line.**
- **Traveled to the USAF Safety Center and reviewed all 88 rotary wing Class A & B mishap reports from FY 85 thru FY 05**
- **Created a data base for initial analysis**
- **Conducted analysis**





Overview



- **Force Overview**
- **Mishap Class By MAJCOM**
- **Cause By Mishap Class**
- **Human Factor vs. Non-Human Factor Rates**
- **MDS Specific Data**
- **Mishaps By Phase of Flight**
- **Night & Brownout**
- **IMC**
- **Experience, Recency, Training & Supervision**
- **Summary**





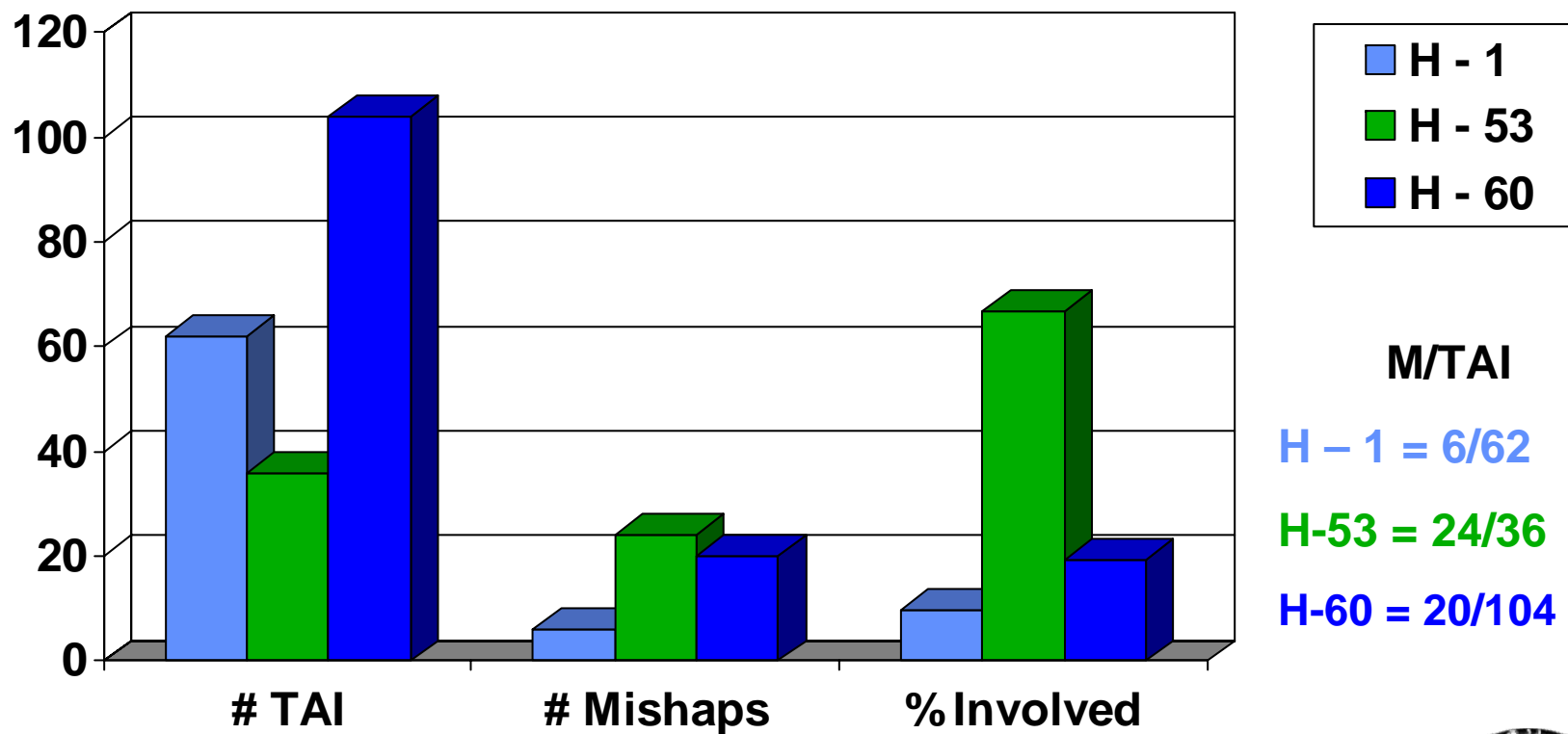
Force Overview

Mishap Penetration





Fraction of Active Inventory, FY 85 – 05, Involved in Class A or B Mishaps



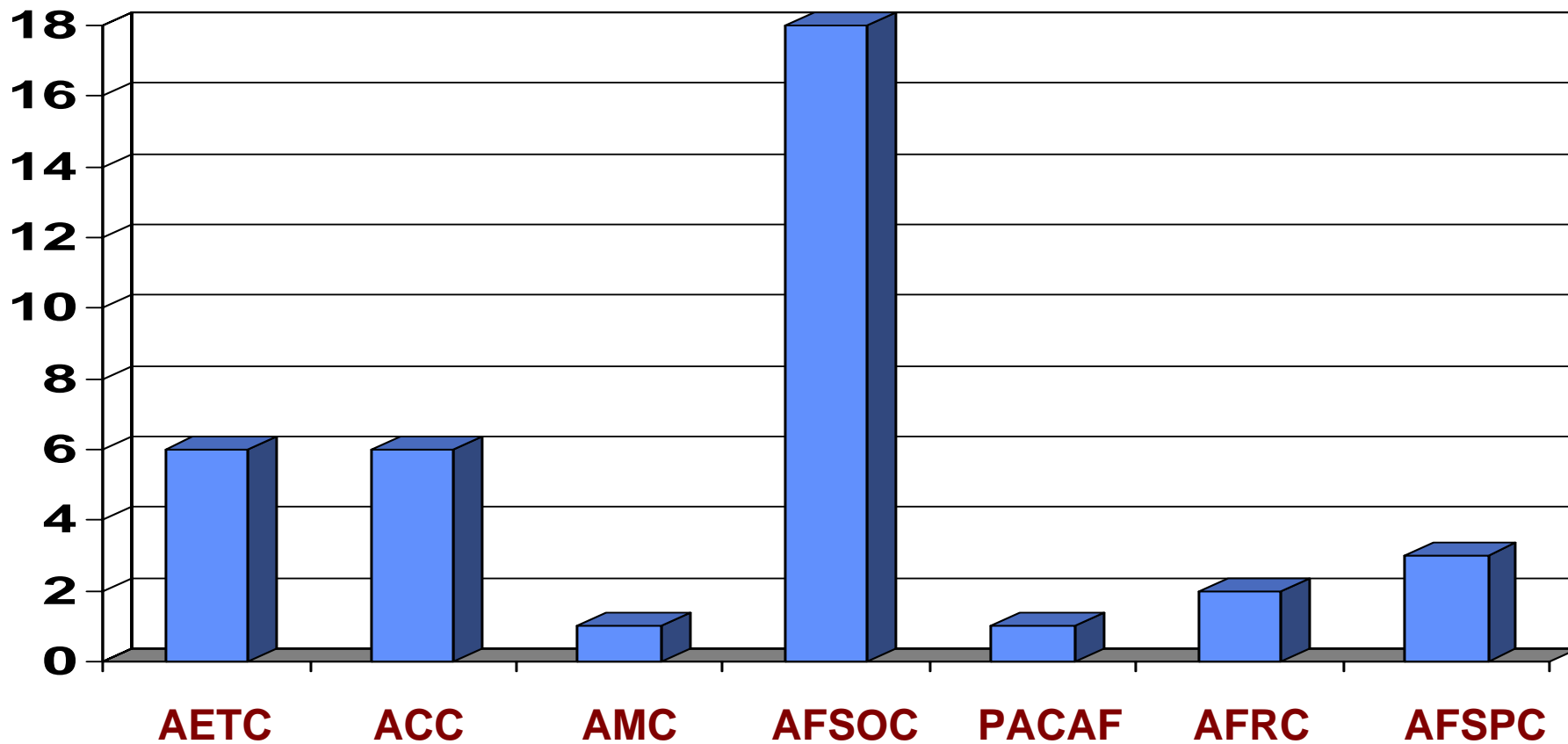


Mishap Class By MAJCOM





Class A By MAJCOM (FY 93-05)

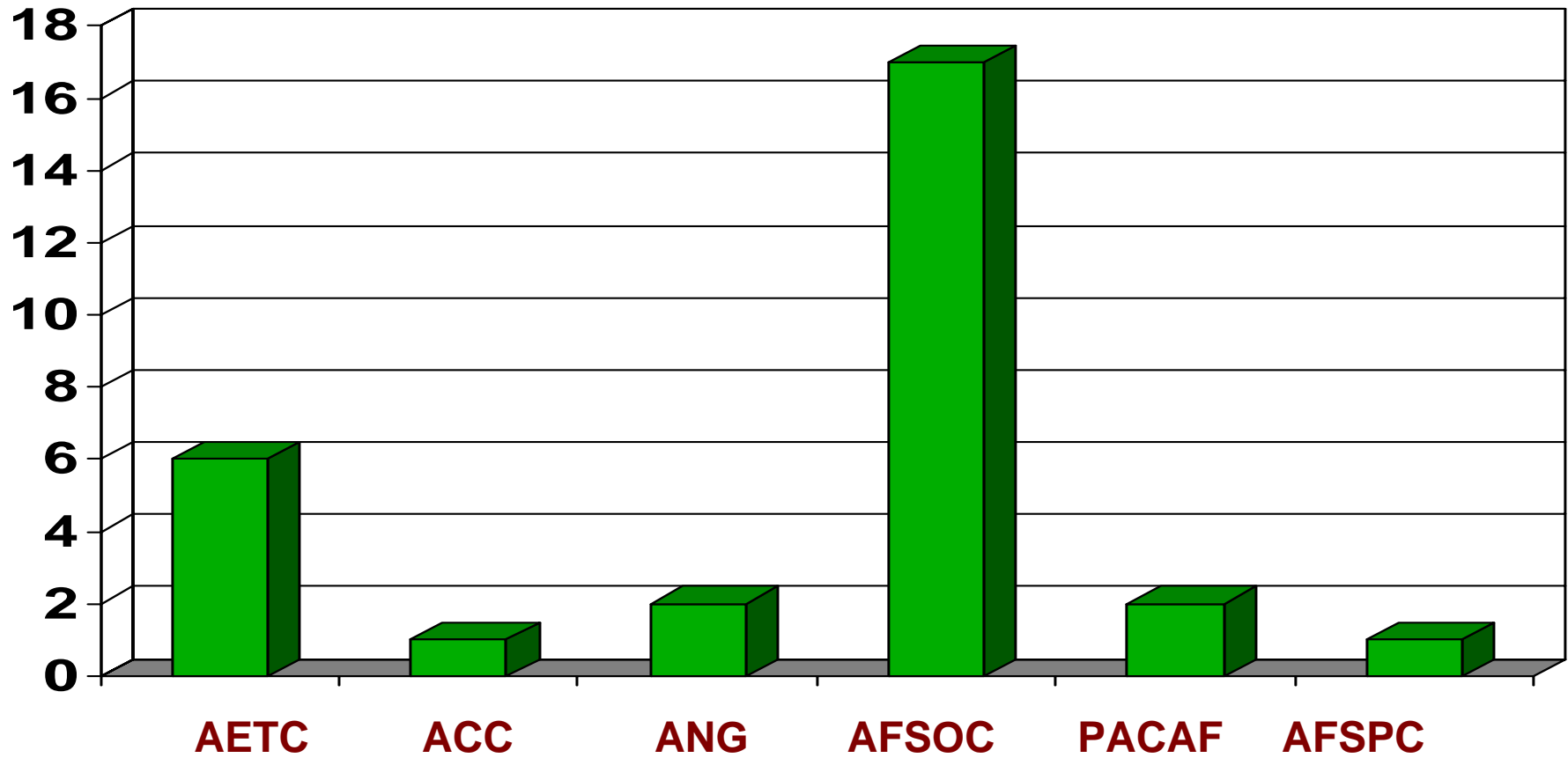


N = 37





Class B By MAJCOM (FY 93-05)

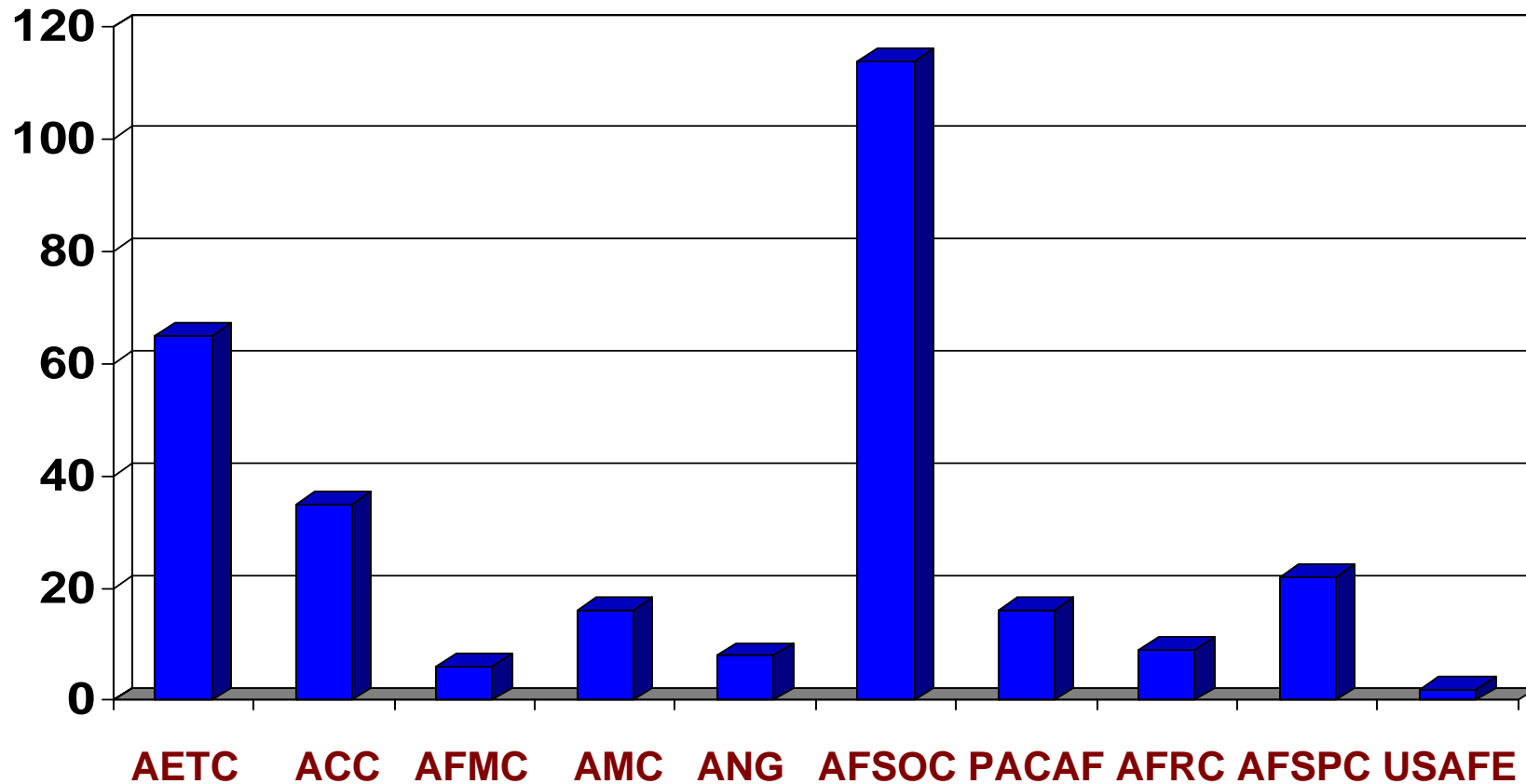


N = 29





Class C By MAJCOM (FY 93 - 05)



N = 293



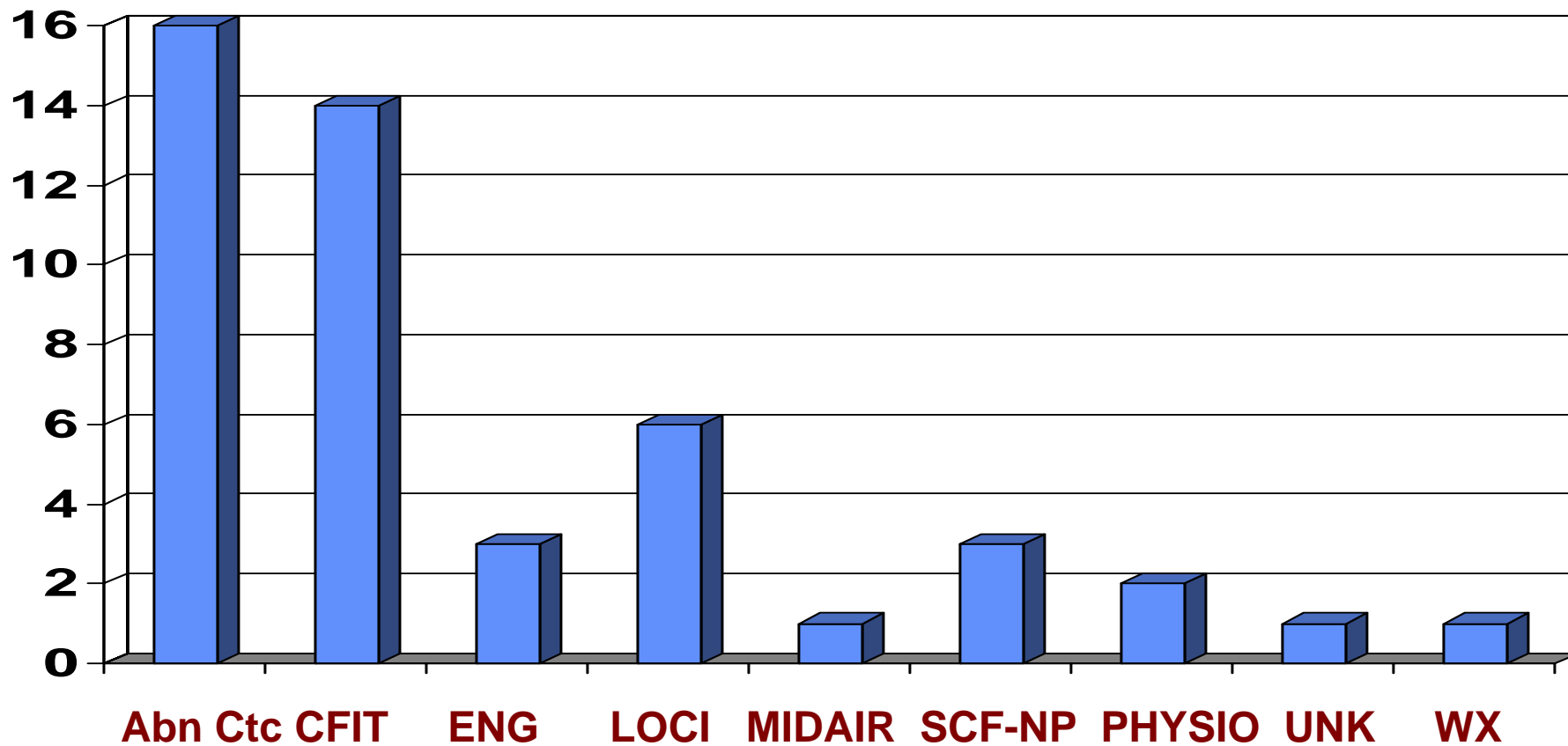


Cause by Mishap Class





Class A By Mishap Cause (FY 93 – 05)

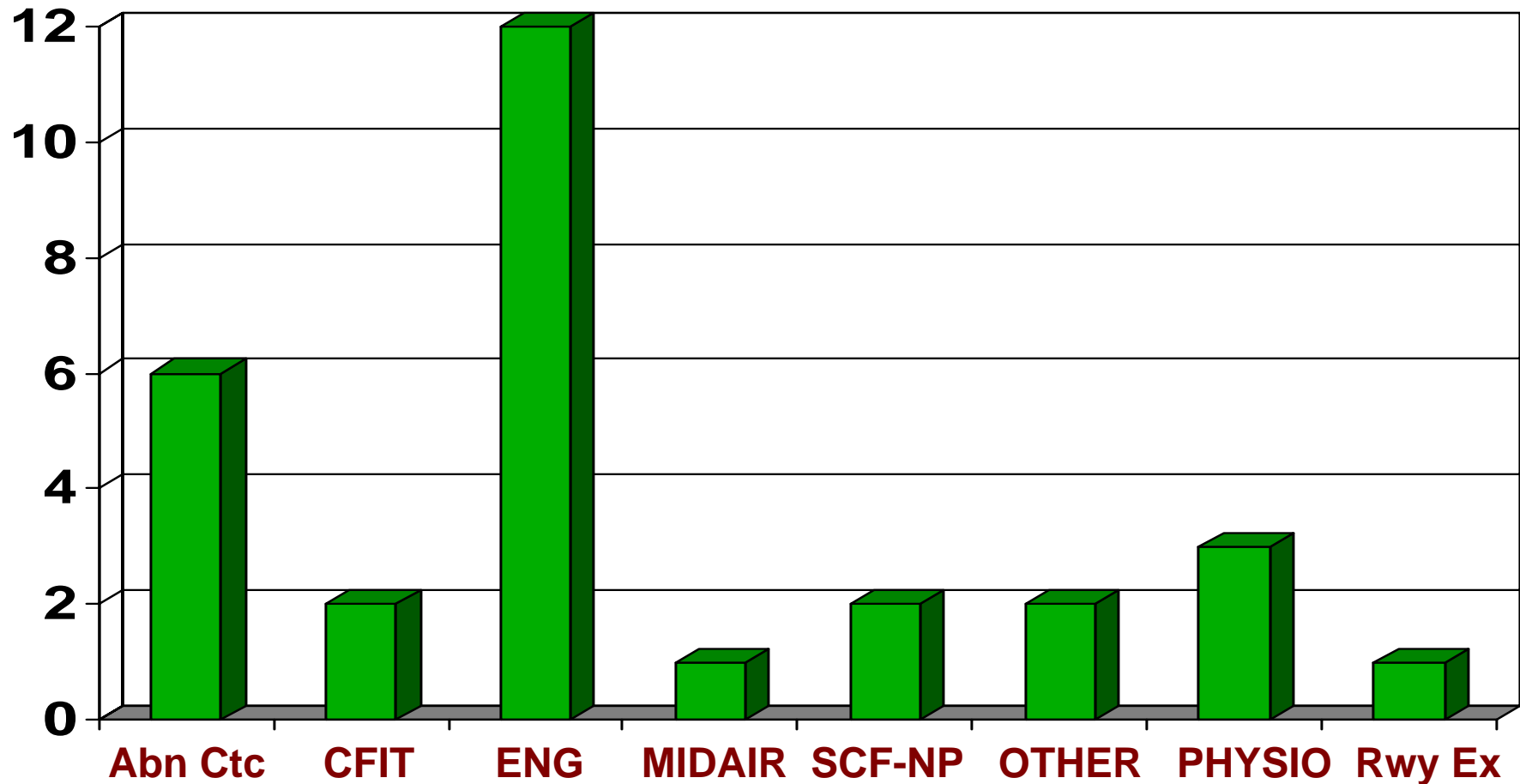


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Class B By Mishap Cause (FY 93 – 05)

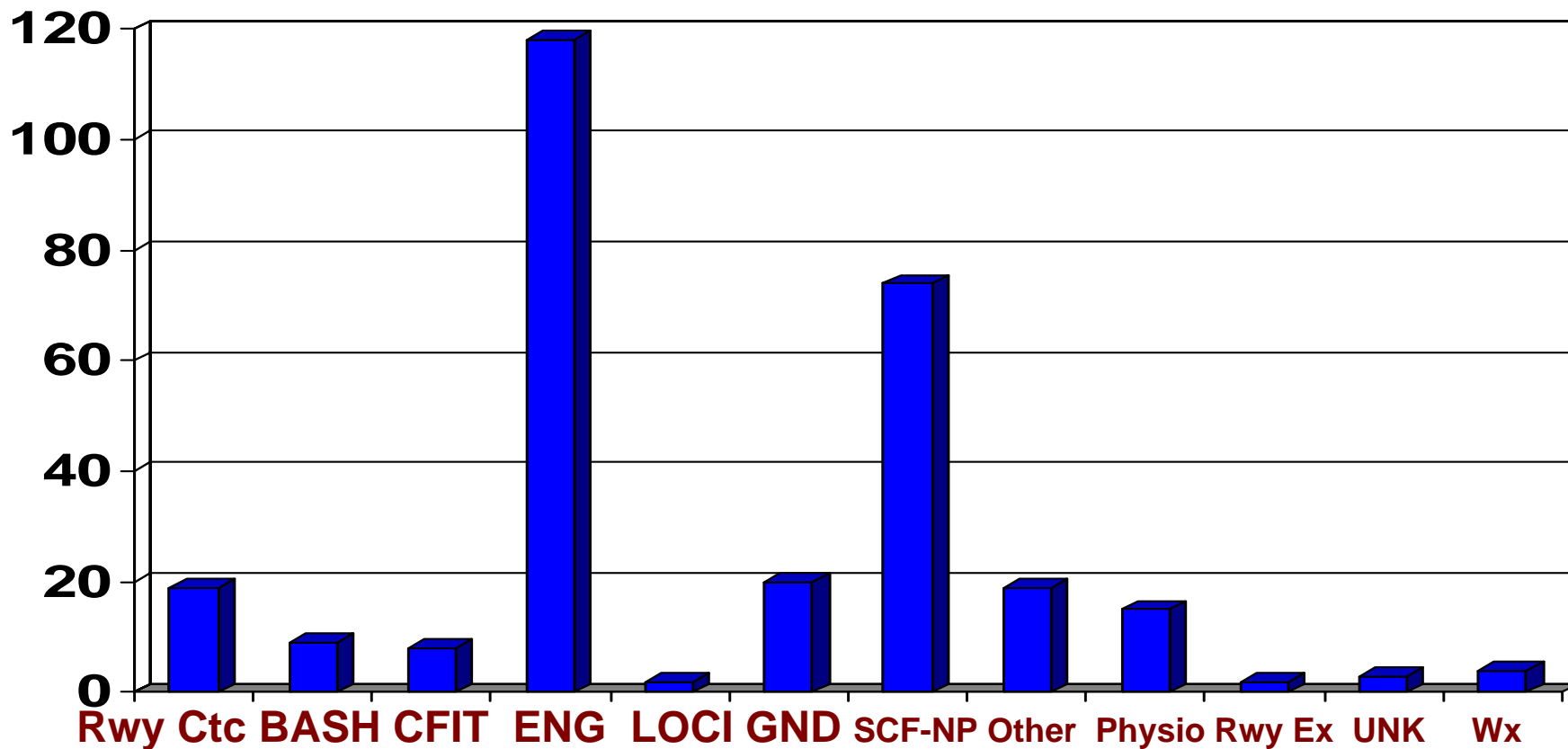


N = 29





Class C By Mishap Cause (FY 93 – 05)



N = 293





**It doesn't look as if Class B & C mishaps
have any predictive value for Class A
mishaps in USAF helicopter data**





Division of Mishaps By Human Factor or Non-Human Factor

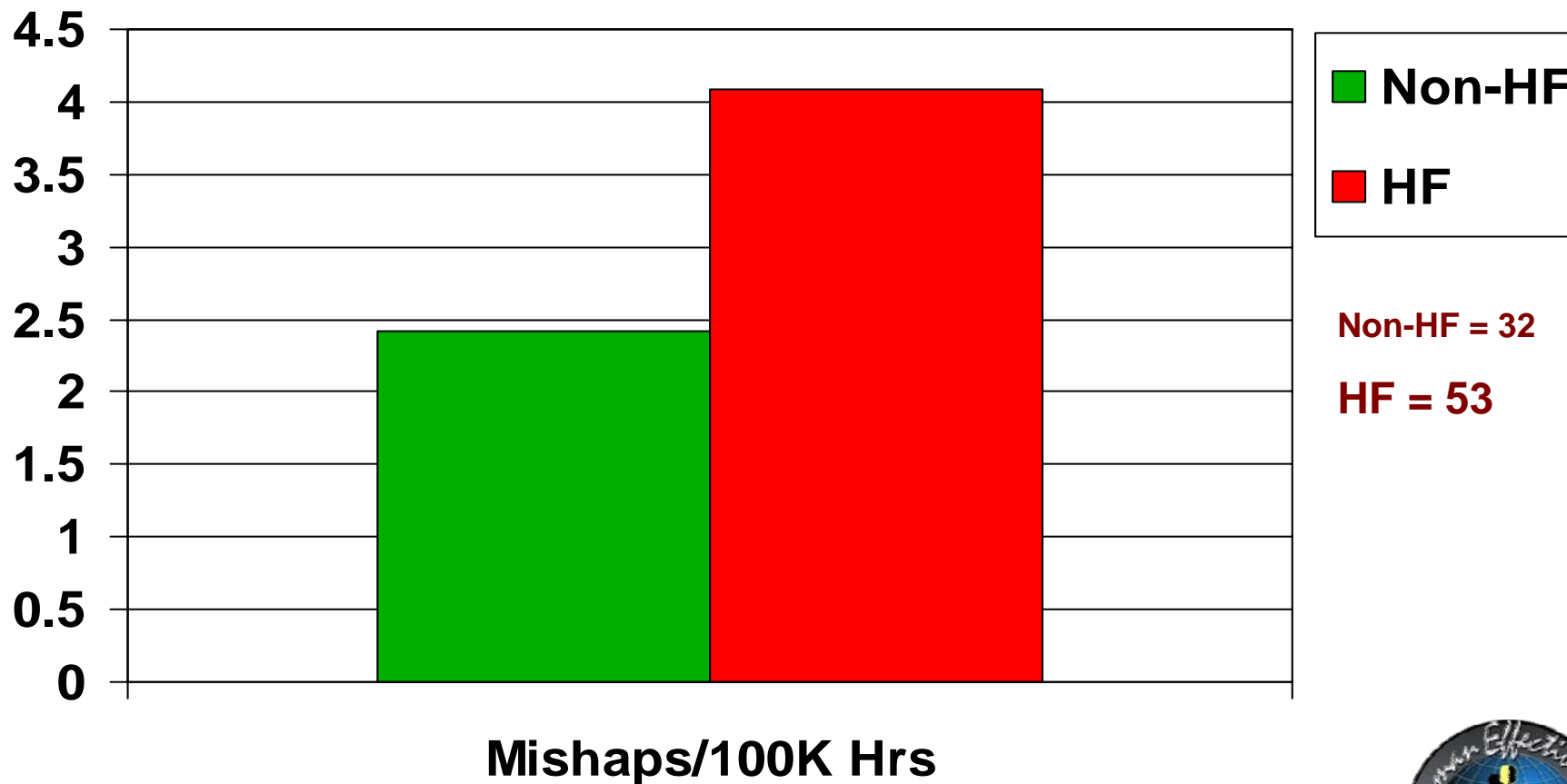




Comparison USAF Rotary Wing Mishap Rates/100K Hrs by HF and Non-HF



FY 85 - 05

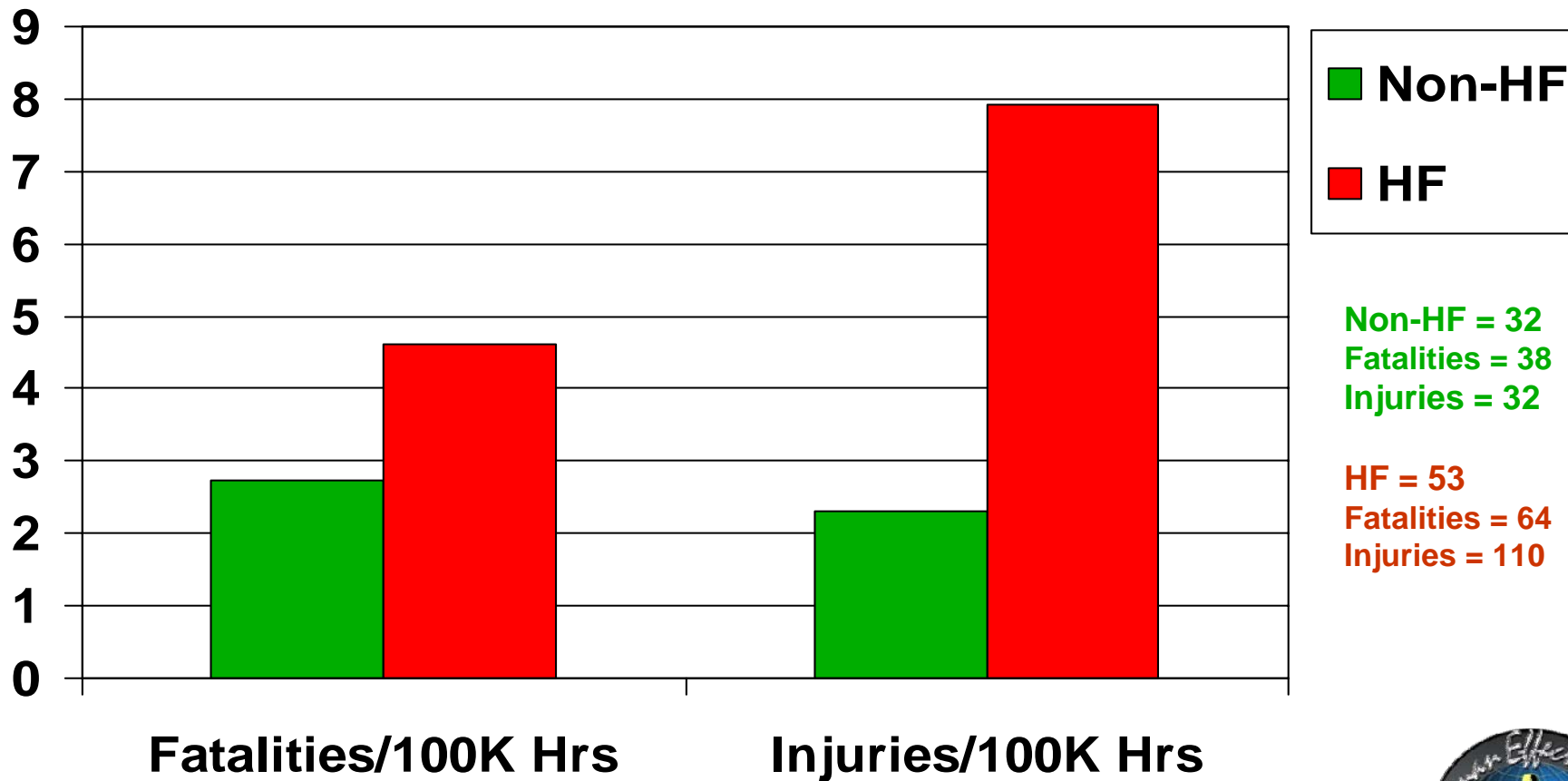




Comparison USAF Rotary Wing Fatality & Injury Rates by HF and Non-HF



FY 85 - 05





**Human Factor mishaps comprise 63%
of the USAF Helicopter mishap
database**

**Human Factor mishaps generate
higher fatality and injury rates
roughly in proportion to the
prevalence of HF mishaps**



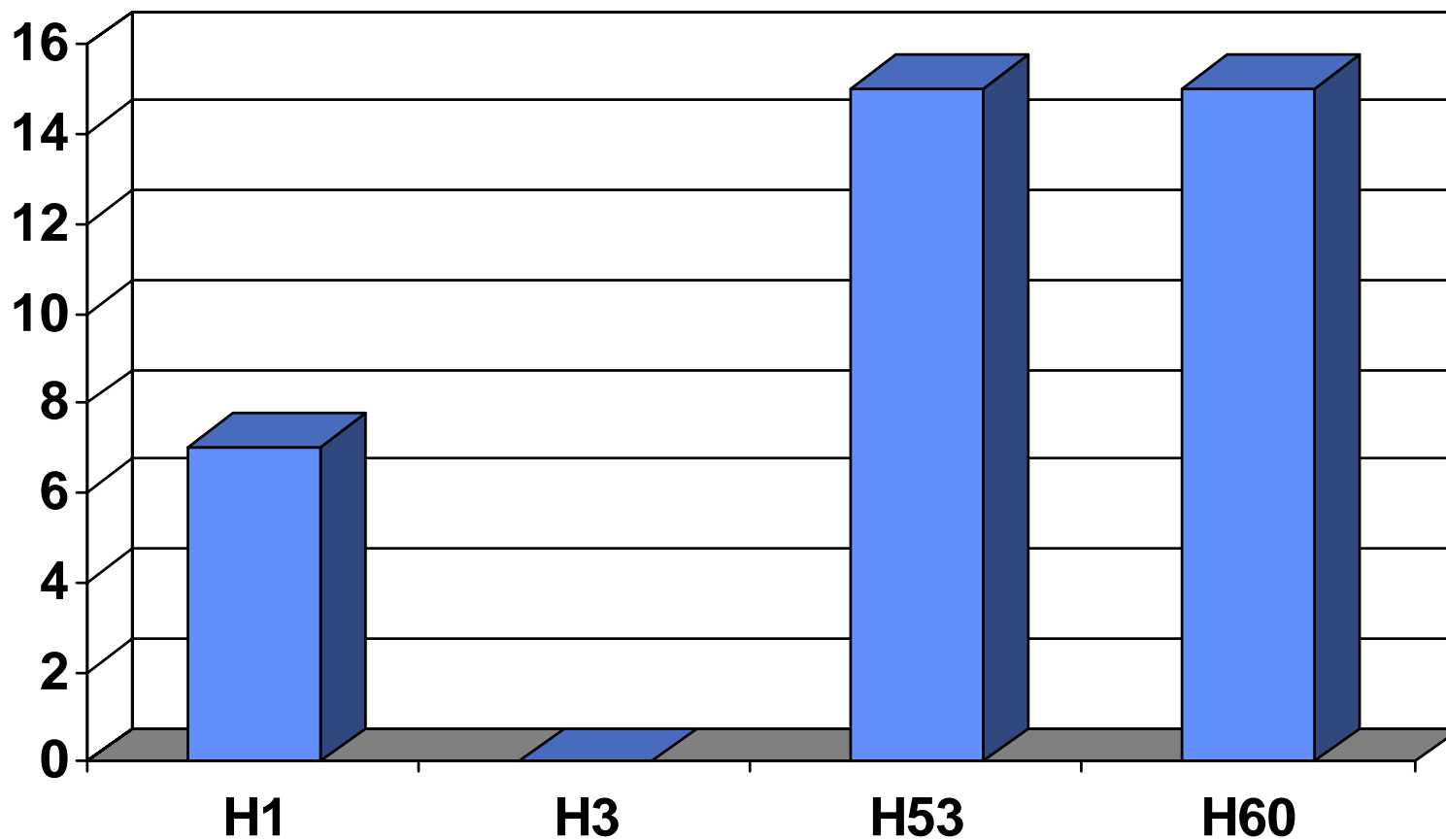


MDS Specific Data





Class A By Airframe (FY 93 – 05)

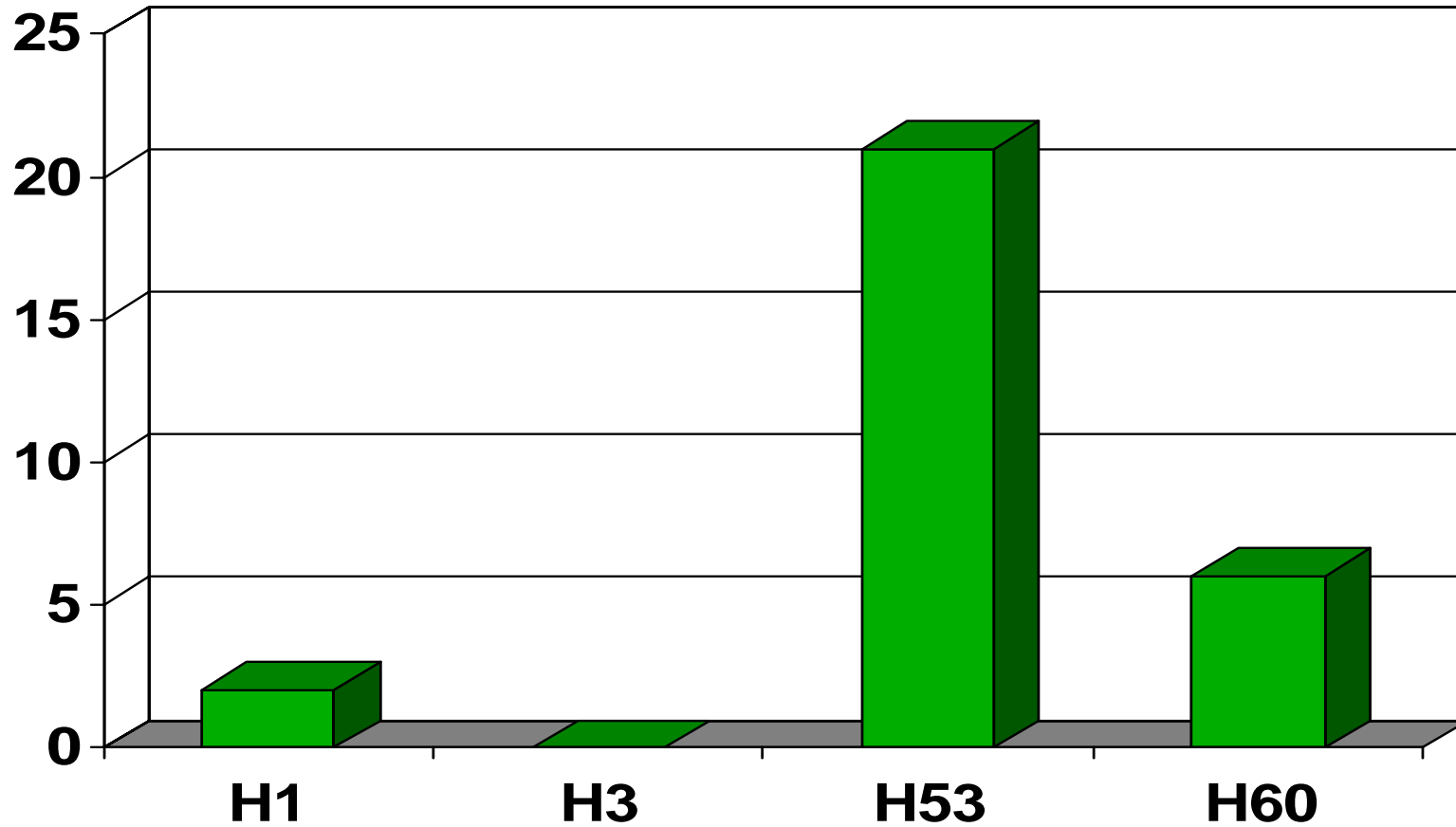


N = 37





Class B By Airframe (FY 93 - 05)

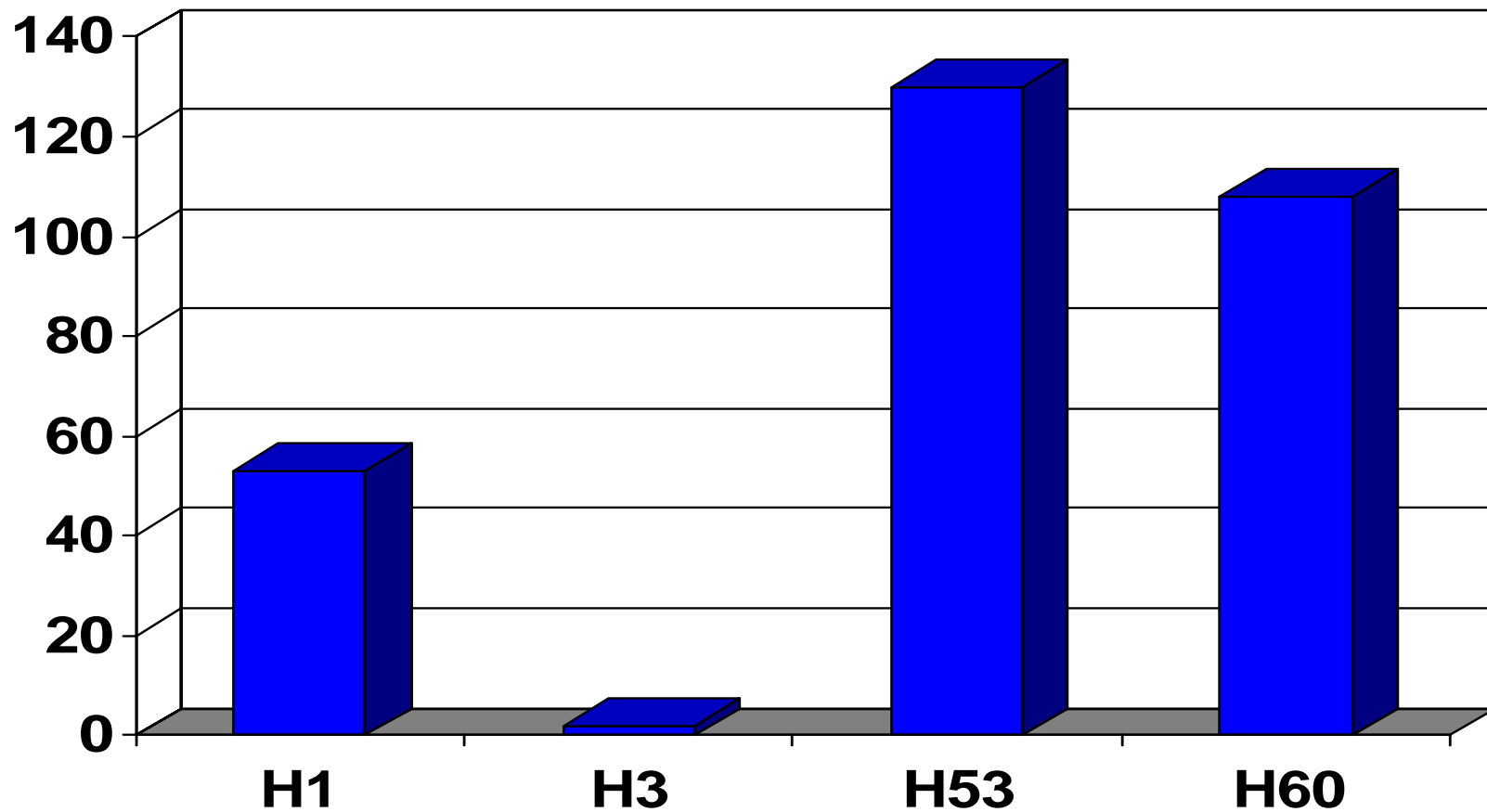


N = 29





Class C By Airframe (FY 93-05)

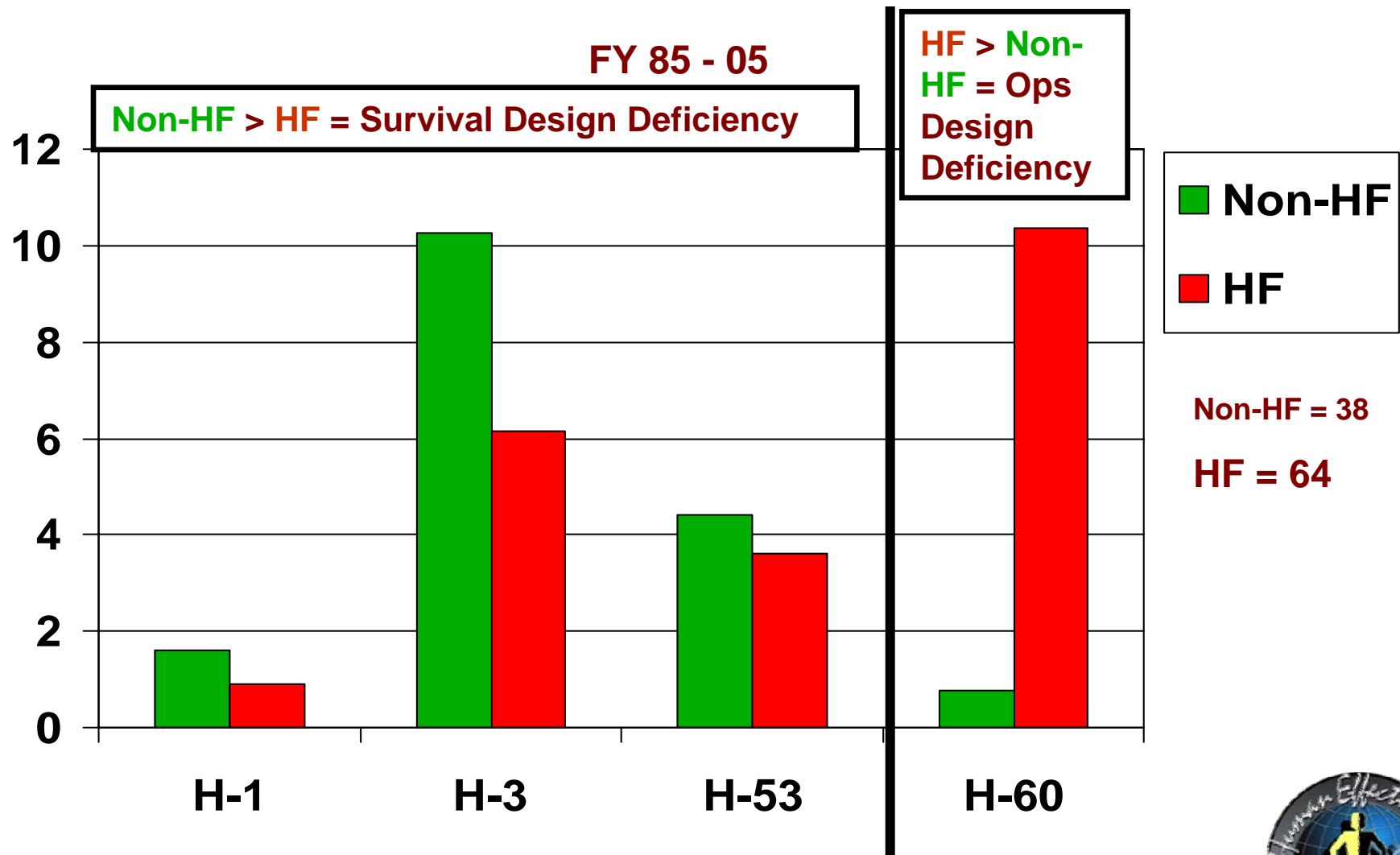


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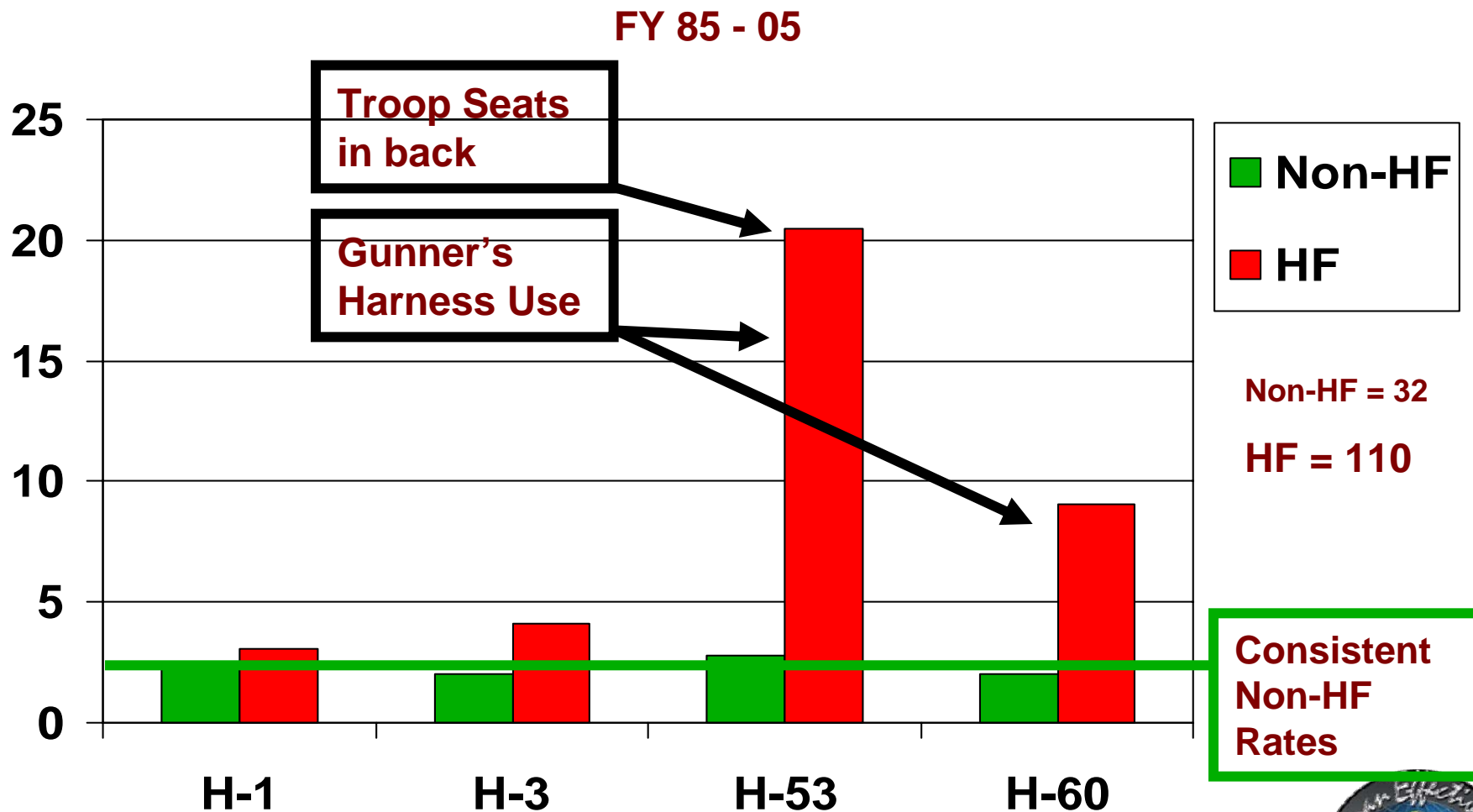


Comparison USAF Rotary Wing Fatality Rates/100K Hours by HF and Non-HF By MDS



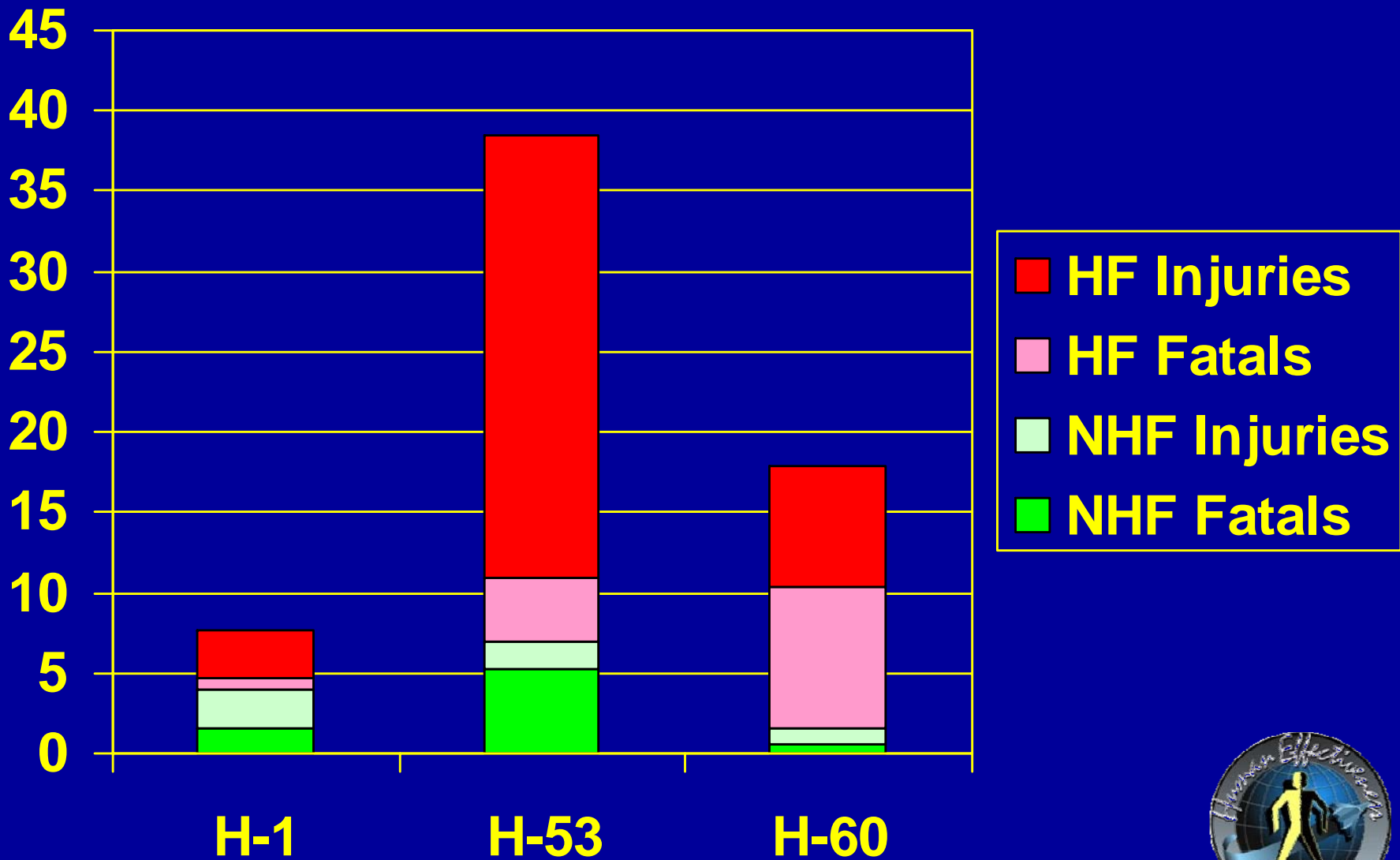


Comparison USAF Rotary Wing Injury Rates/100K Hours by HF and Non-HF By MDS





USAF Combined Fatality & Injury Rates/100K Hours By MDS FY 85-05





It appears that the H-60 MDS has a severe problem with it's mission generating a high HF Fatality Rate

Both the H-53 & the H-60 experienced very high mortality and morbidity compared with the H-1, the aircraft of the other services and fixed wing aircraft





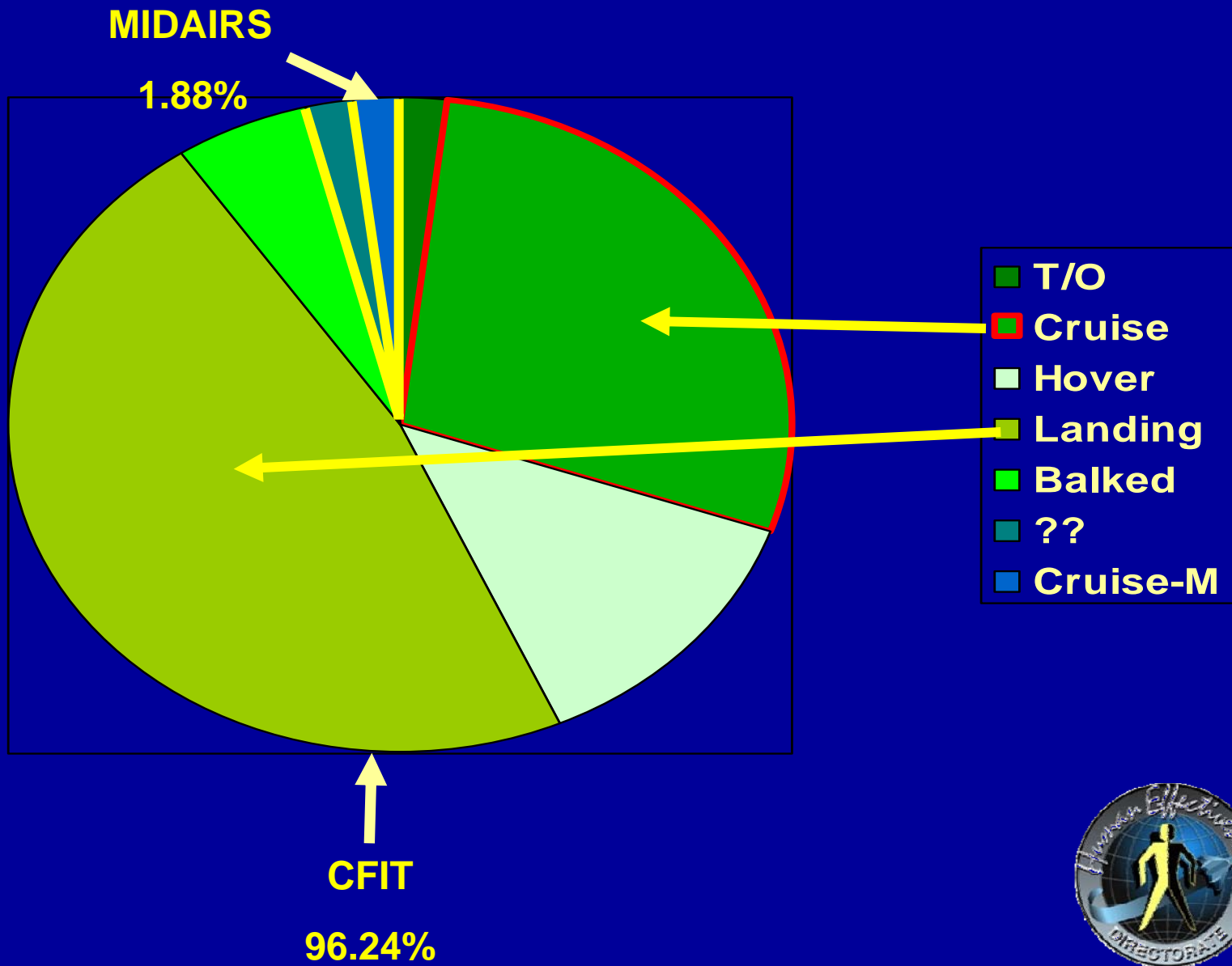
Mishaps, Injuries and Fatalities By Phase of Flight





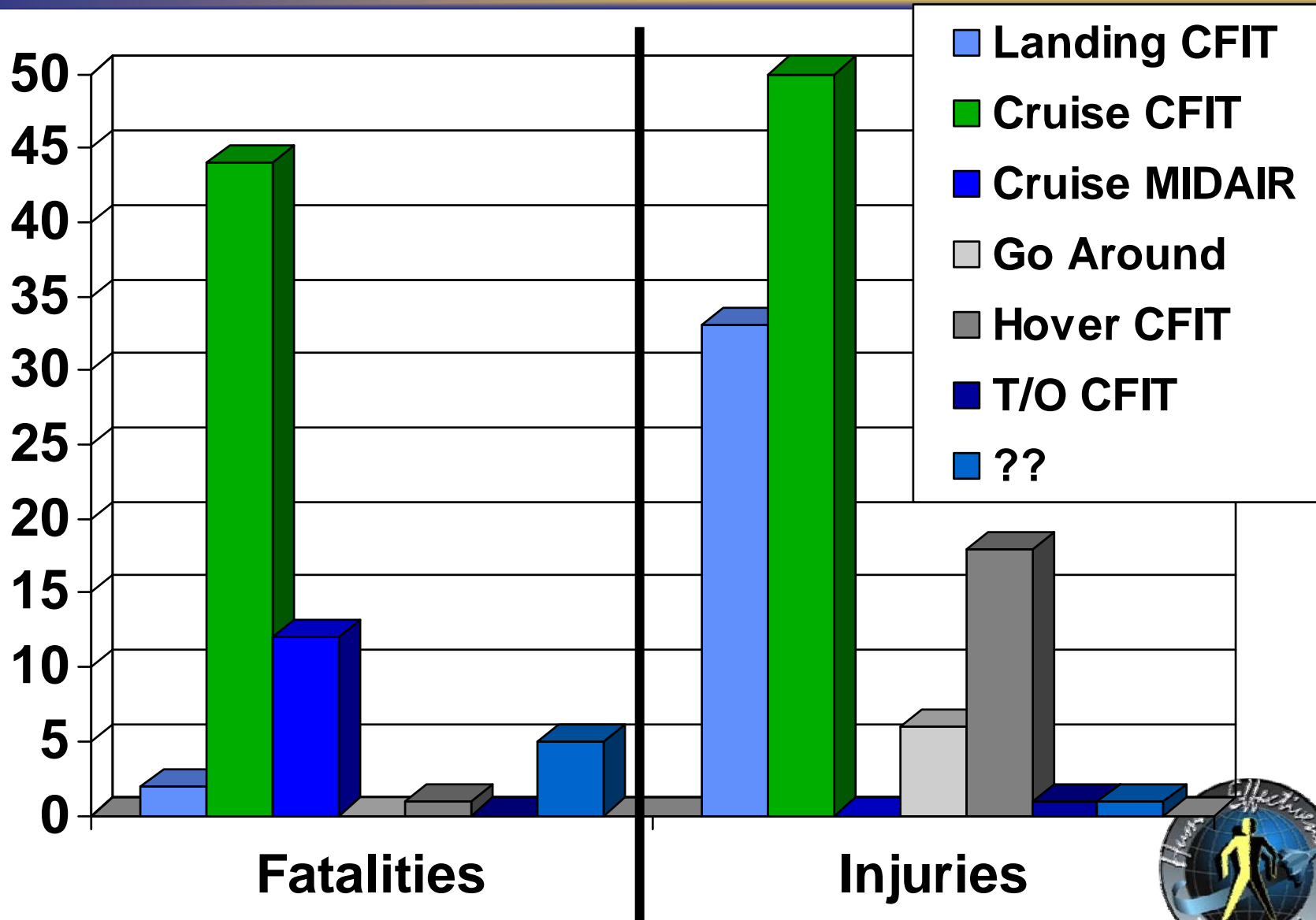
USAF Rotary Wing Mishaps FY 85-05, By Flight Operation

HF Mishaps by Type & Phase



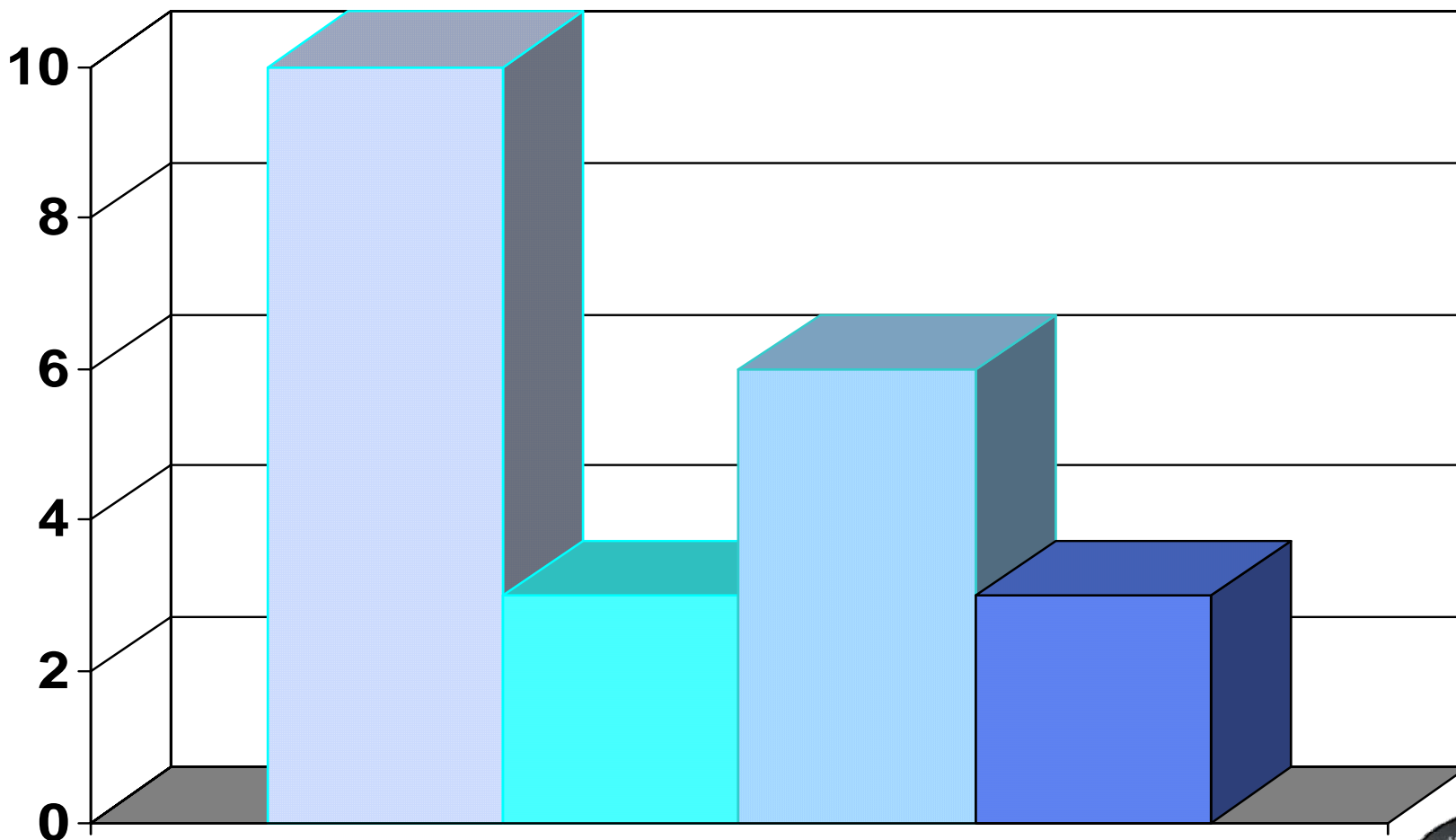


USAF Rotary Wing # of Fatalities & Injuries, FY 85-05, By Flight Operation





USAF Rotary Wing Landing Mishaps FY 85-05, By Mechanism

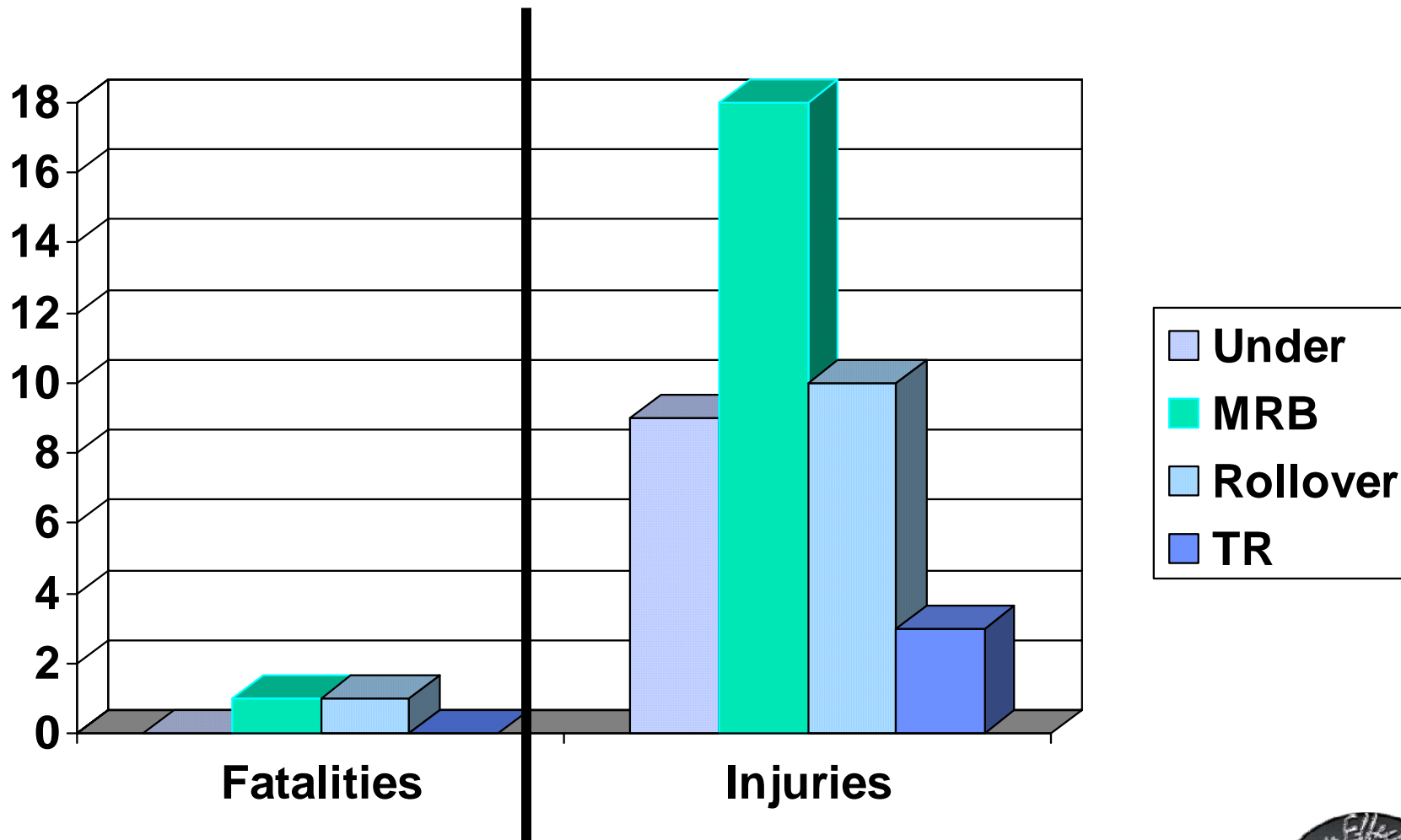


Under MRB Strike Rollover TR Strike





USAF Rotary Wing # Landing Fatalities & Injuries, FY 85-05, By Mechanism

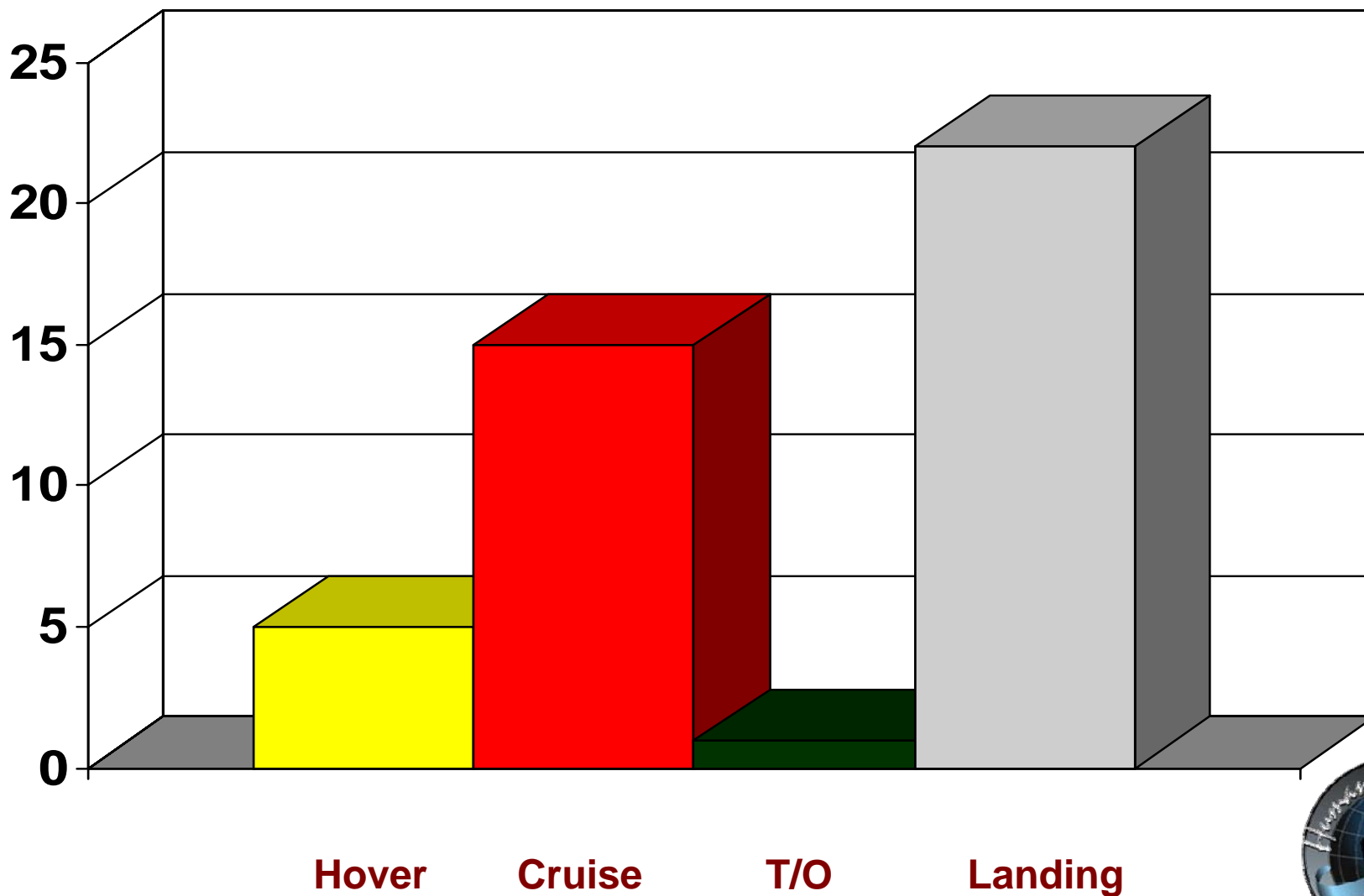


Note: Some Lat MRB due to droop



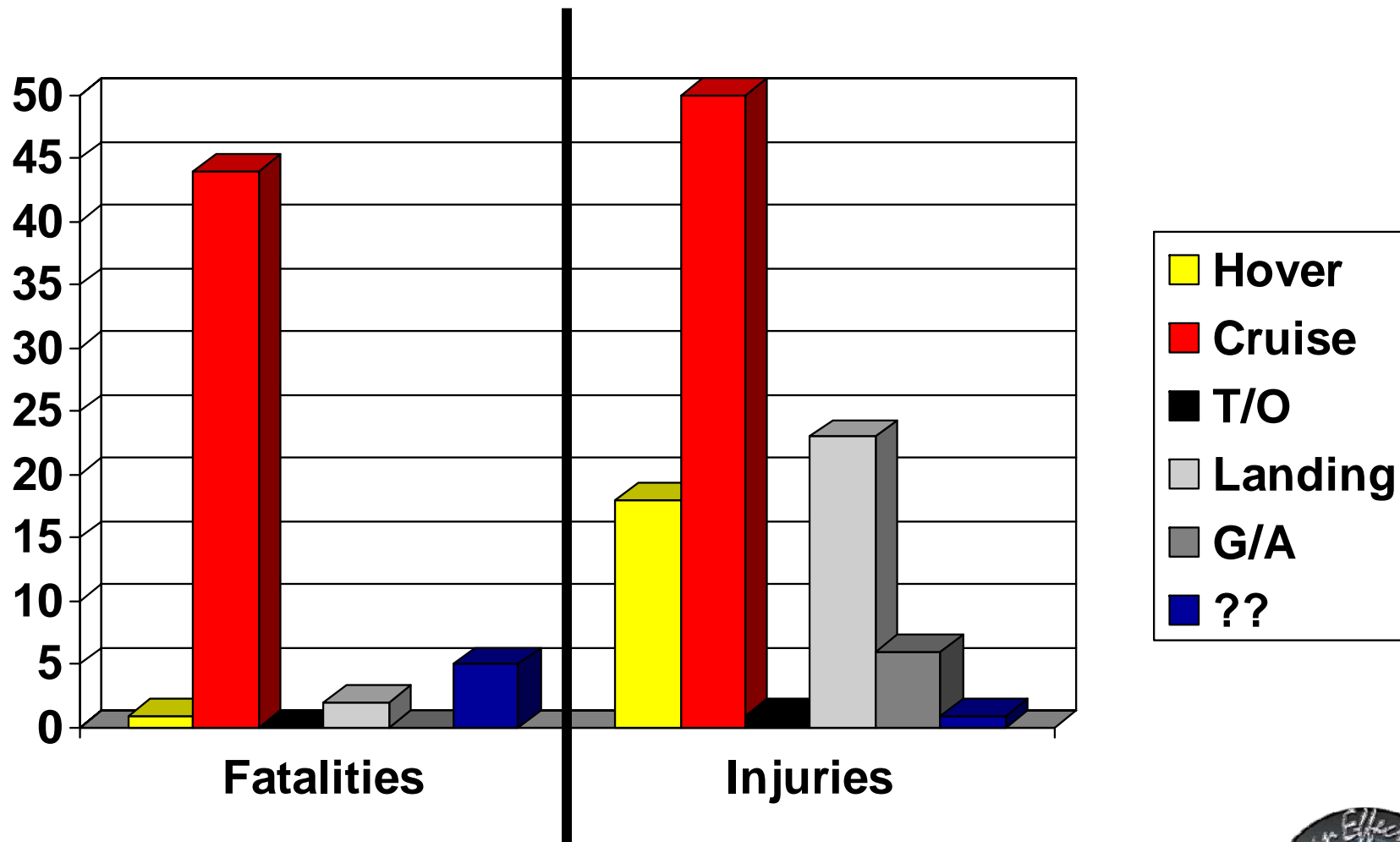


USAF Rotary Wing CFIT Mishaps FY 85-05, By Type





USAF Rotary Wing # CFIT Fatalities & Injuries, FY 85-05, By Type





CFIT in Cruise Flight was the Most Lethal and Injurious Numerically

Midair Collision and Wire Strikes were uniformly lethal



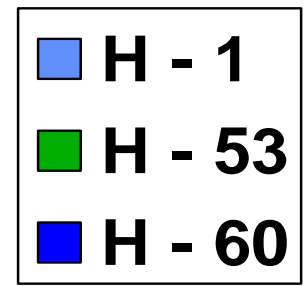
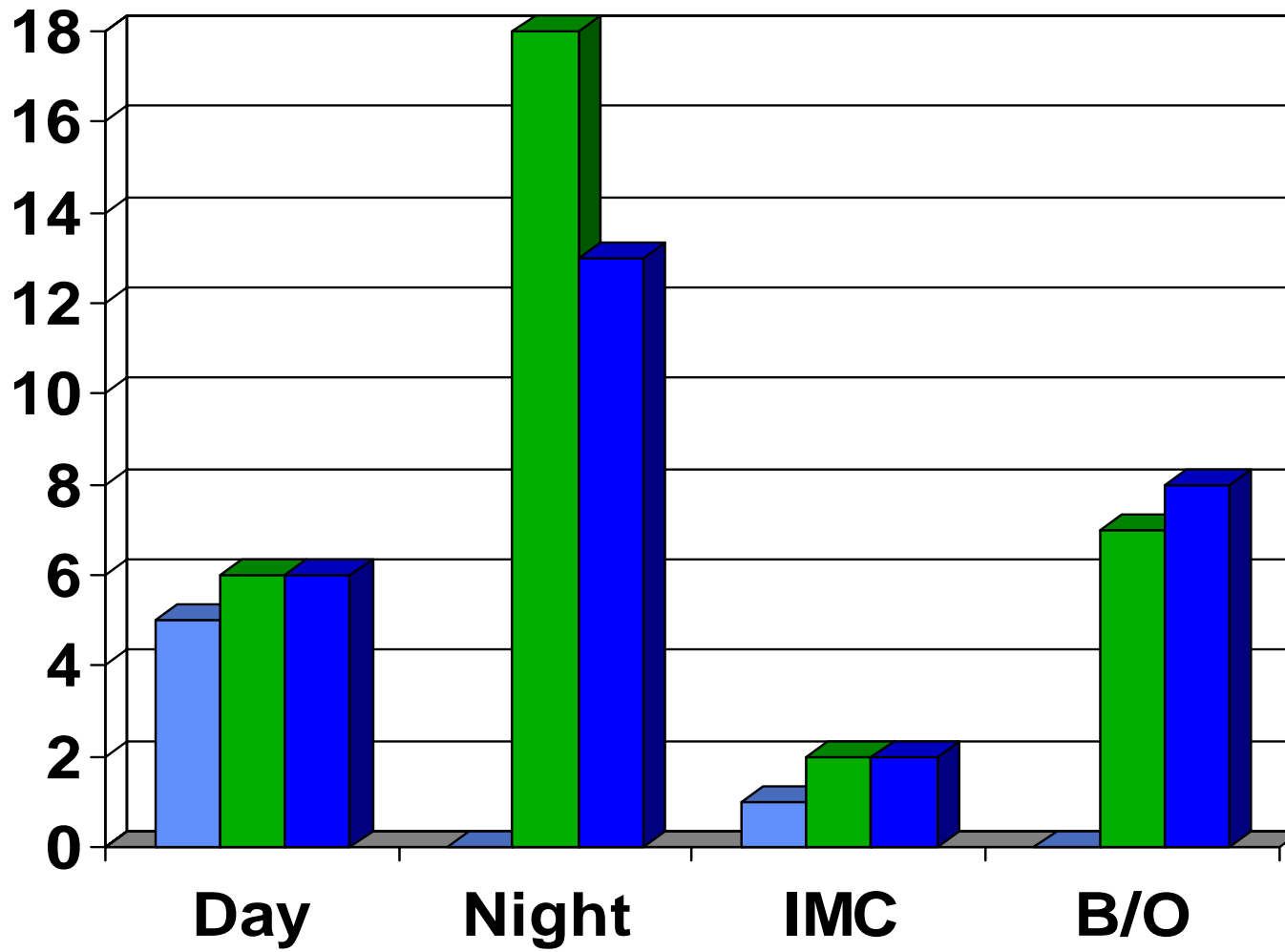


Night & Brownout





USAF Human Factor Class A & B Rotary Wing Mishaps, FY 85 – 05, Reduced Visibility/Night

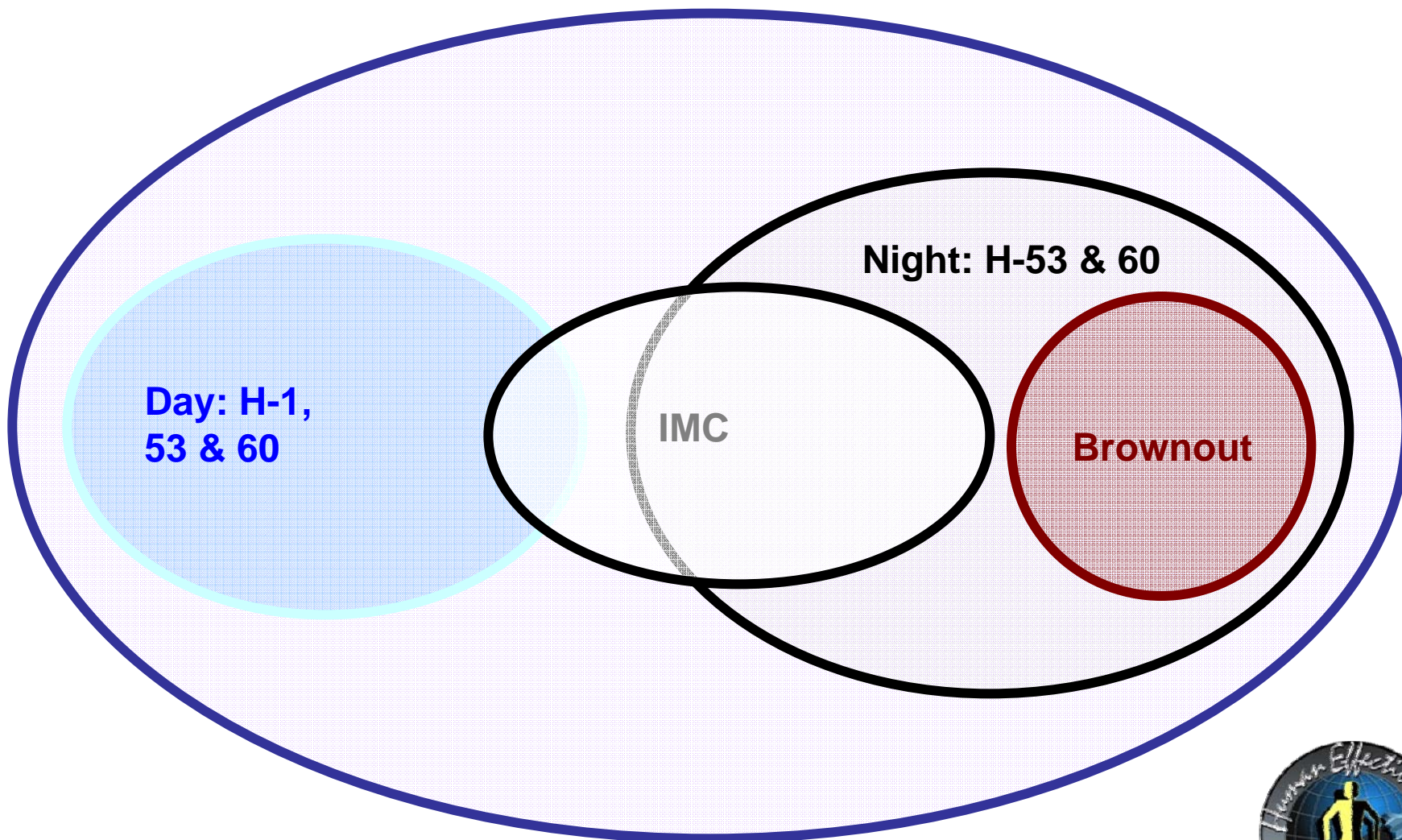


NOTE:
All IMC
and B/O
mishaps
occurred
at night
in H-60 &
H-53 A/C



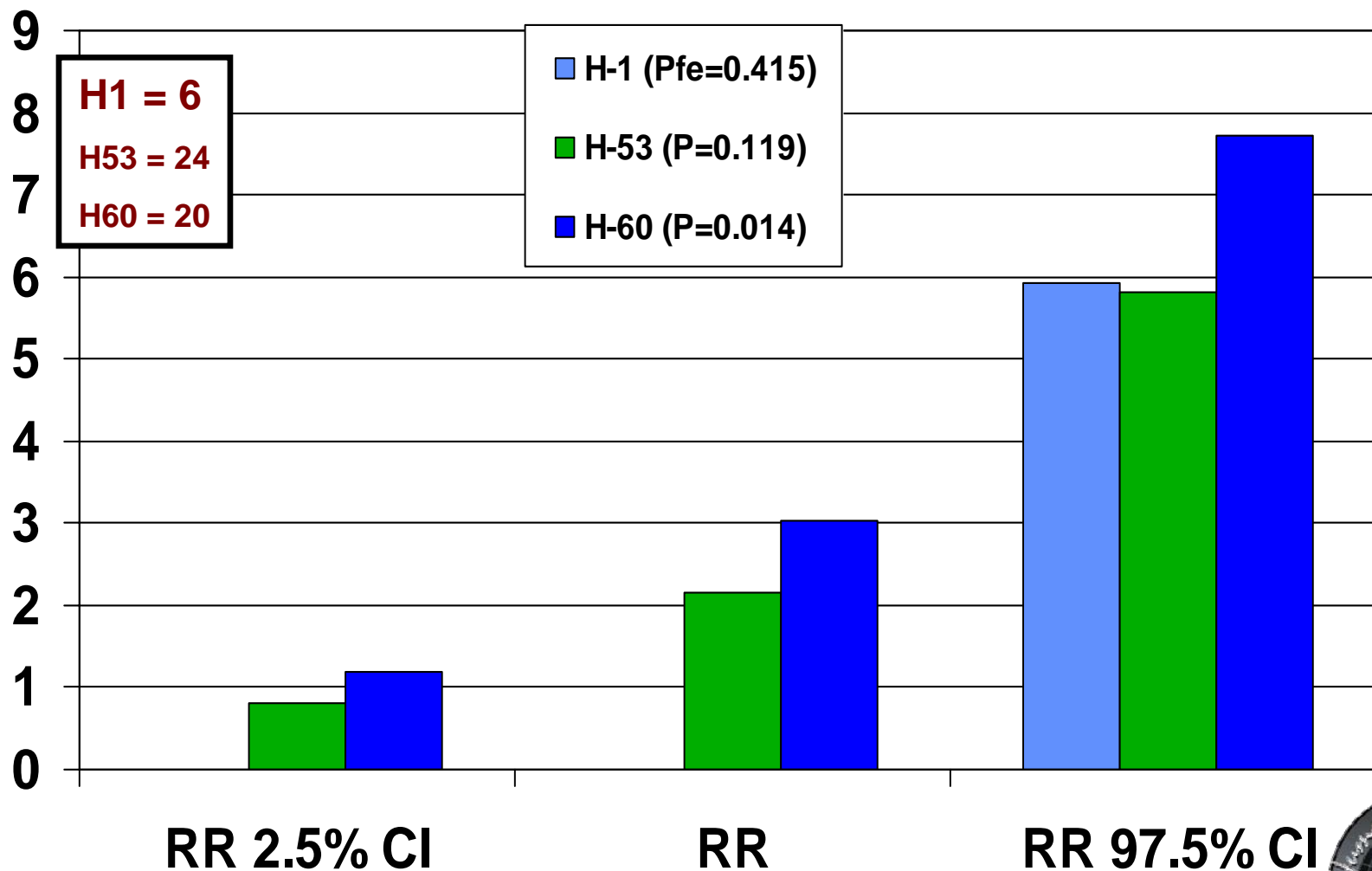


Distribution of USAF Human Factor Rotary Wing Mishaps





Relative Risk of Night USAF Class A & B Rotary Wing Mishaps, FY 85 – 05, By MDS



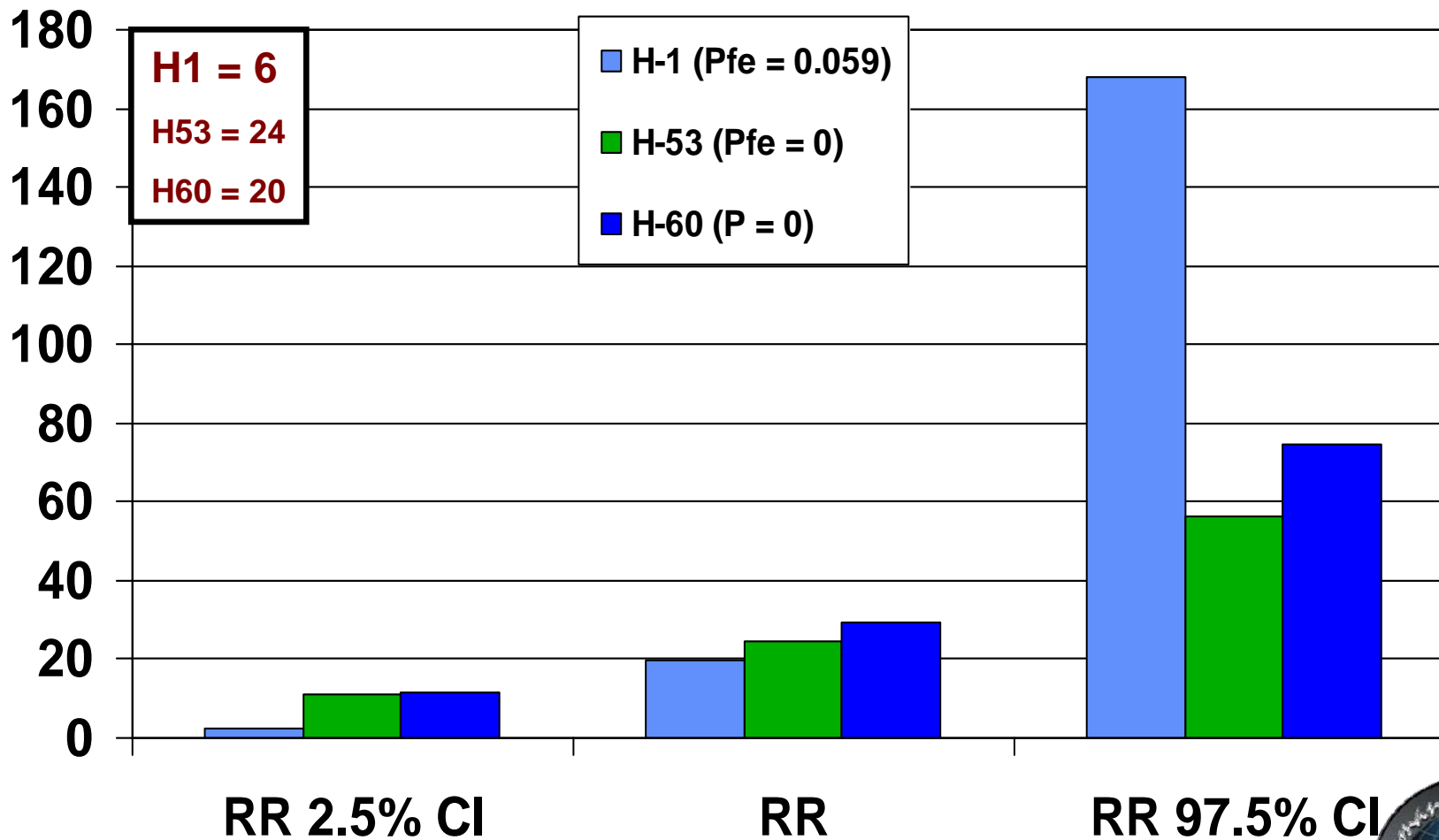


Instrument Meteorological Conditions





Relative Risk of IMC USAF Class A & B Rotary Wing Mishaps, FY 85 – 05, By MDS



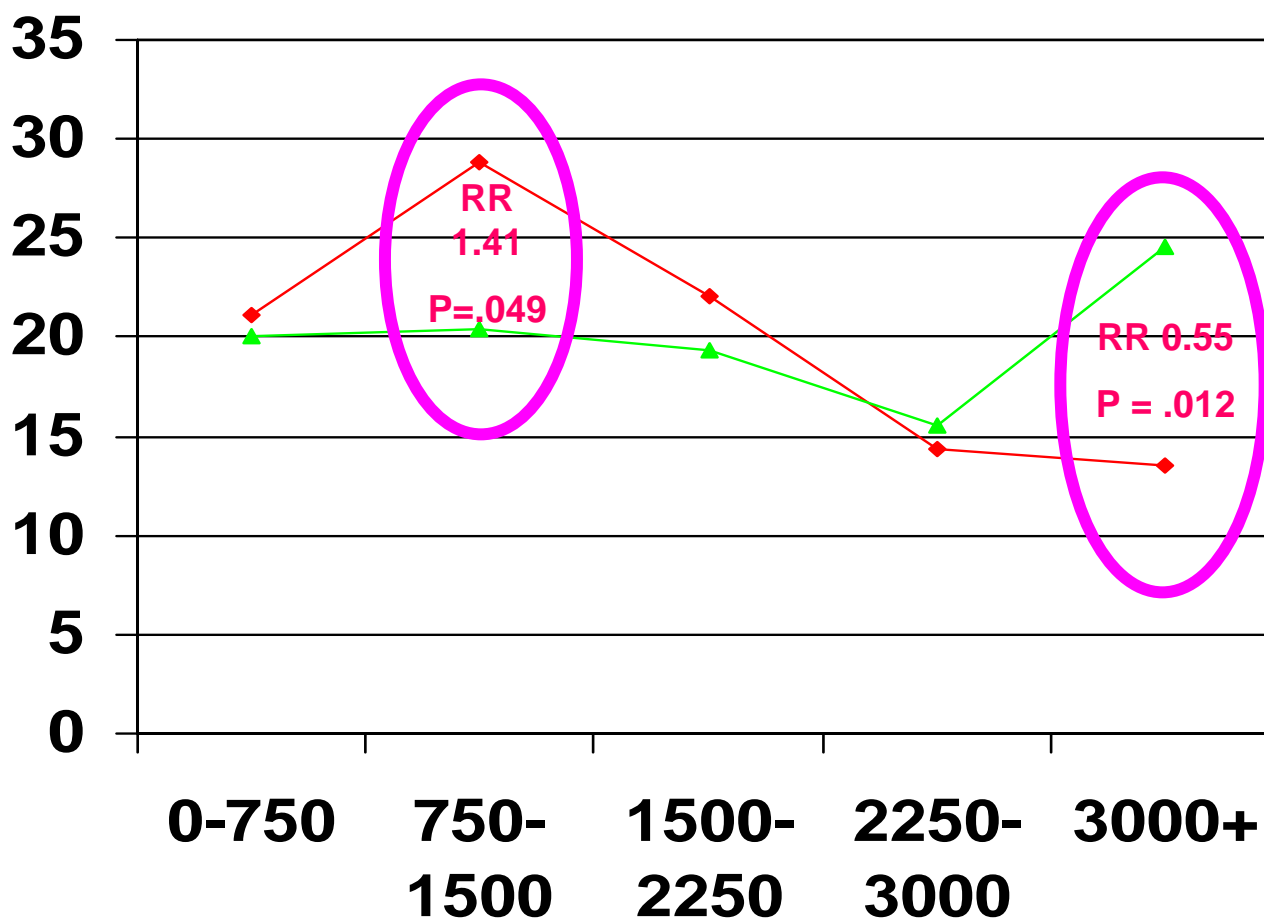


Experience, Recency, Training & Supervision





Total Flying Time & Mishaps USAF Rotary Wing Pilots (FY85 – 05)



◆ Mishap
▲ USAF

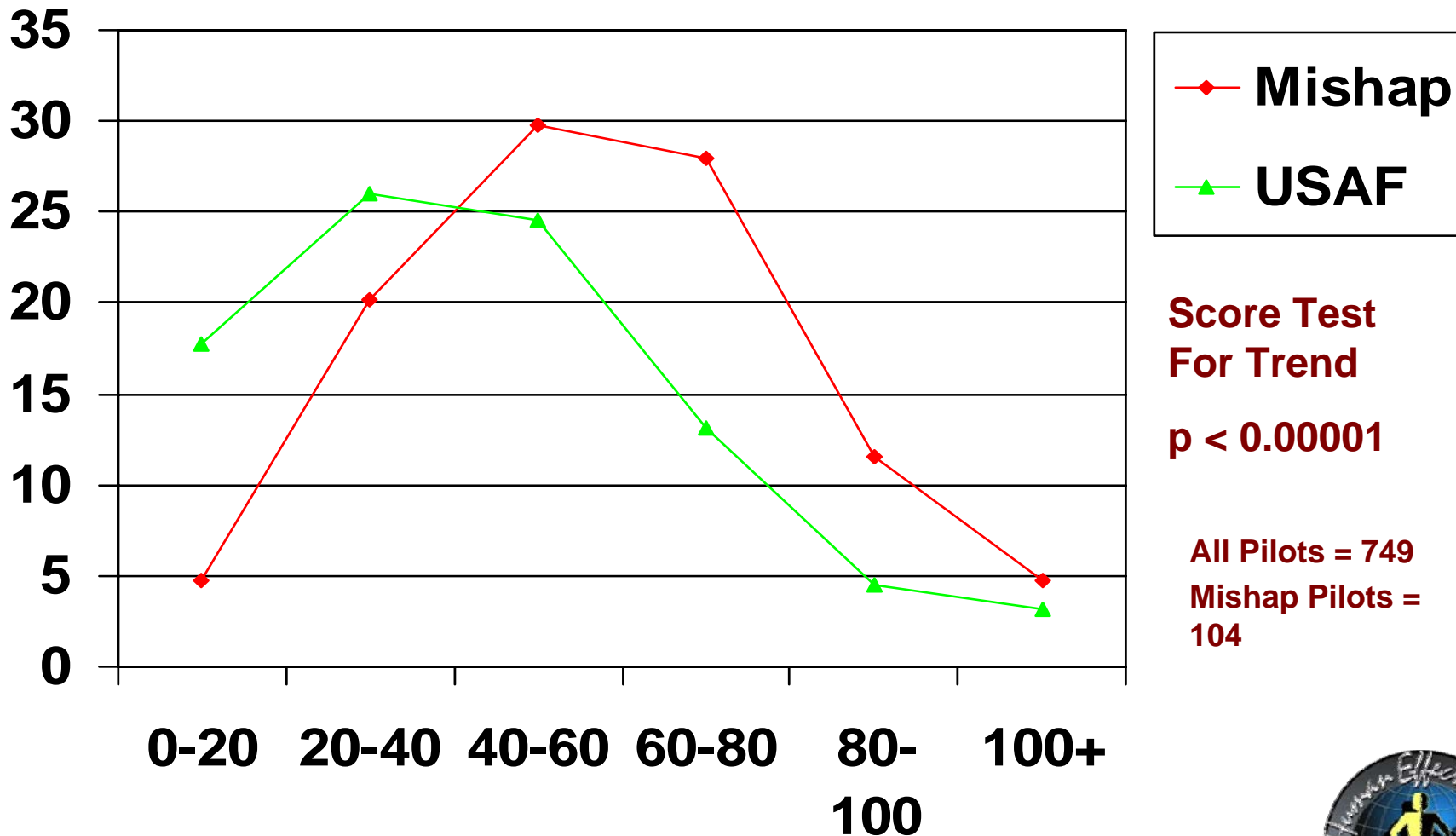
Score Test
For Trend
 $P < 0.00001$

All Pilots = 745
Mishap Pilots = 104



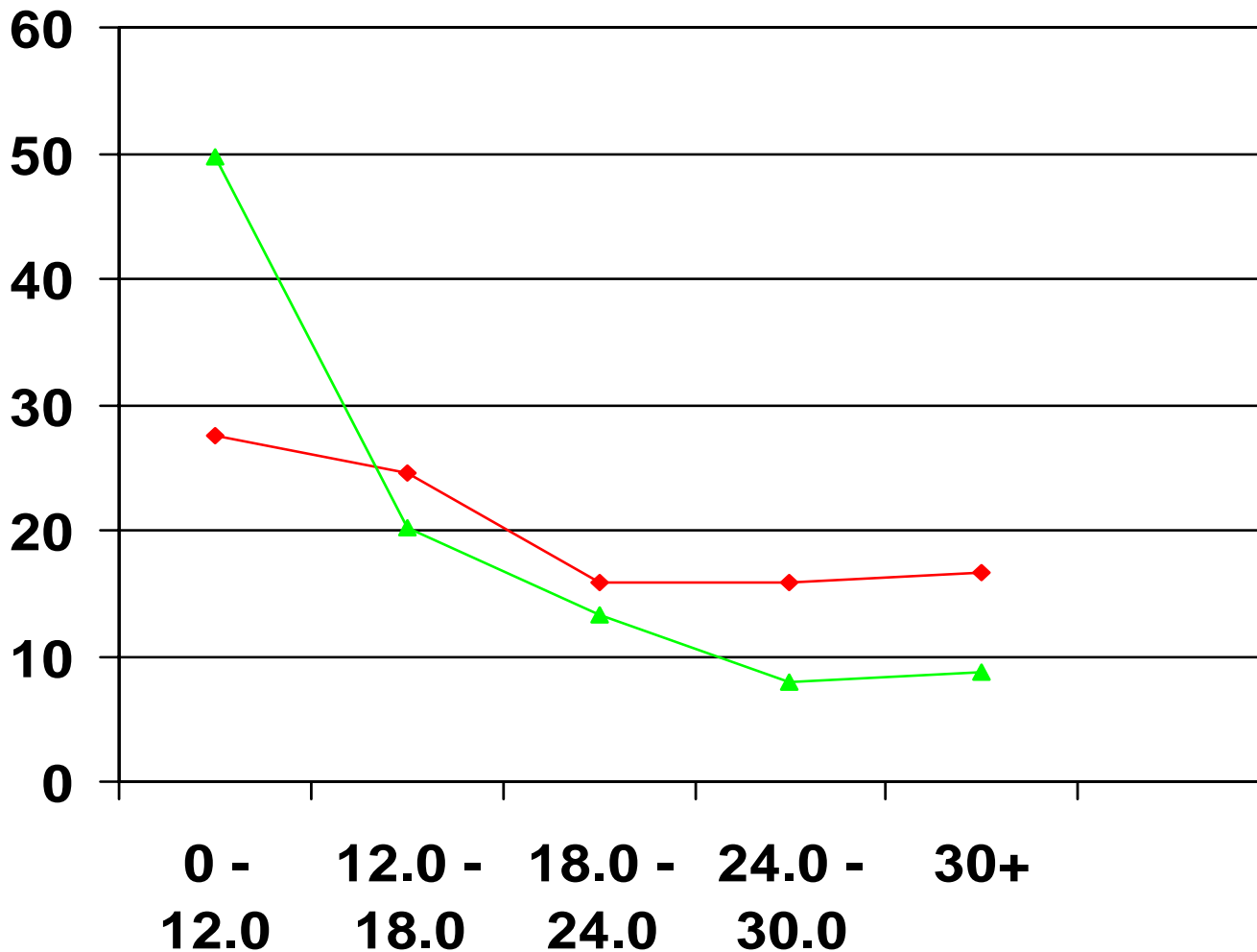


90 Day Recent Flying Time & Mishaps USAF Rotary Wing Pilots (FY85 – 05)





30 Day Recent Flying Time & Mishaps USAF Rotary Wing Pilots (FY85 – 05)



◆ Mishap
▲ USAF

**Score Test
For Trend**
p < 0.00001

**All Pilots = 742
Mishap Pilots =
104**





SUMMARY



- Class B & C USAF helicopter mishaps do not predict USAF Class A mishaps
- Helicopters are the most lethal and injurious manned air vehicles operated by the USAF and sustain the highest mishap, fatality & injury rates
- Night flight in USAF helicopters is riskier than day flight but relatively half as risky as night flight in fighter/attack aircraft
- IMC flight in helicopters is an order of magnitude more dangerous than IMC flight in fighter/attack aircraft
- Restricted visibility flight damages the most helicopters
- Cruise CFIT kills the most people (High V²)
- Training and supervision of mid-level helicopter pilots appears to be less than ideal
- The H-53 design results in safety concerns
- H-60 utilization creates mission concerns





Questions?

