



**United States Helicopter Safety Team**  
Our Vision: A Civil Helicopter Community with Zero Accidents



# The Super Hero Helicopter Pilot



# Nick Mayhew



Link Simulation & Training

**USHST Industry Outreach Chair**  
**Training Work Group Chair**

## The Demand

- **Helicopter production forecasts. 4,300 to 4,800 global civilian use helicopter deliveries over next 5 years (Honeywell 2016).**
- **Asian aviation markets growing rapidly. Airfields cannot cope or do not exist and heliports offer good alternative. (Price Waterhouse Cooper 2016)**
- **Military retention; The military are training less.**
- **Realize that hours and experience do not always determine competency.**

## What is experience?

- **“The knowledge or skill acquired by a period of practical experience of something, especially that gained in a particular profession” or “the process of doing and seeing things and having things happen to you” (Oxford Dictionary)**
- **Experience – Is that marvelous thing that enables you to recognize a mistake when you make it again (Jones n.d.)**



**“Never let a man tell you  
that he has 20 years of  
experience when he  
really has one year of  
experience repeated 20  
times”  
(John Bent).**

**“Good judgement comes from experience, and experience comes from bad judgement” (Jones n.d.)**

## What is Competency?

**“The combination of Knowledge, Skills and Attitudes (KSA’s) required to perform a task to a prescribed standard under certain conditions”**

*Competency definition (ICAO)*



# USHST

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**Growing new licensed pilots is  
not the problem! > 200 schools  
worldwide.....**

**....but most use time and  
maneuver based training.**

## Safety

- Helicopter accident stats remain high. IHST Trends. USHST stats did not meet 80% 10 year reduction.
- To decrease accident rate we need professional pilots trained from ab initio.
- Human Factors and ADM major part of the curriculum.

## IHST Standard Problem Statements (SPS) and Intervention Recommendations (IR)

- ECAST (FW) SPS – 70% **HF** and 52% **SMS/Culture**
- IR – Flight  
Ops/**SMS/Culture/Training/Instructional/Regulatory/Standards/Guidelines**
- IHST Compendium Report – 84% **HF** and 43% **SMS/Culture**
- IHST IR – **Training/Instructional/Data/Info/SMS.**

## CAST Response – Ab Initio

- Recommendations from 1998-2008 reduction goal.
- MPL – Multi Crew Pilot License (CRM) (Competency Based)
- HF Training insufficient (TEM)
- Soft skills or “Airmanship” skills training



## Part 121 Airlines – Lufthansa pioneers in 1956!

- 2009 formulates ab initio to MPL format.
- Integrates Threat and Error Management (TEM)
- Integrates Human Factor (HF) Training.







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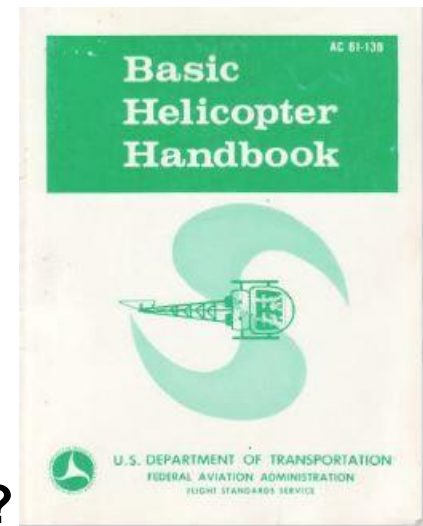
## JHSAT Recommendations

- **Training/Instructional Intervention Recommendations (IRs) Level 2. Clear what is required!**
- **Advanced Maneuver Training – 39%**
- **Safety Training – 35%**
- **Basic Training – 29%**
- **Mission Specific – 15%**
- **CFI Training – 14%**
- **Make/Model Transition – 10%**



## Brief History of US Pilot Training

- Maneuver focused, adapted from IERW, CRM, ADM, SRM, TEM, HF Airmanship only mentioned in special emphasis in PTS. European skill test guidance very similar.
- 1943: US Military Rotary Wing Training
- 1965: FAA publishes AC 61-13 (HFH 2012)
- 1970s: Vietnam War
- 1990s: Civilian Market for Rotary Training
- Addition of low cost aircraft grew this market
- No real simulation!
- Now TAA? Accident reduction? HF Training?
- Ab Initio Pro Pilot Course?



## The Pro Pilot Course



What does this look like?



## Aptitude Testing and Selection

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**Private License – including use of AATD synthetic devices for procedures, emergencies, pre solo stage checks.**

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**PRIVATE  
+AATD**

**PRIMACY...  
...PRIMACY  
.....PRIMACY...**



**Integrated (alternating) ground and flight training to include, CRM, SRM, TEM, ADM, HF, TAA training.**



Immerse in a safety culture mentality from the very first day.

**SMS TRAINING**

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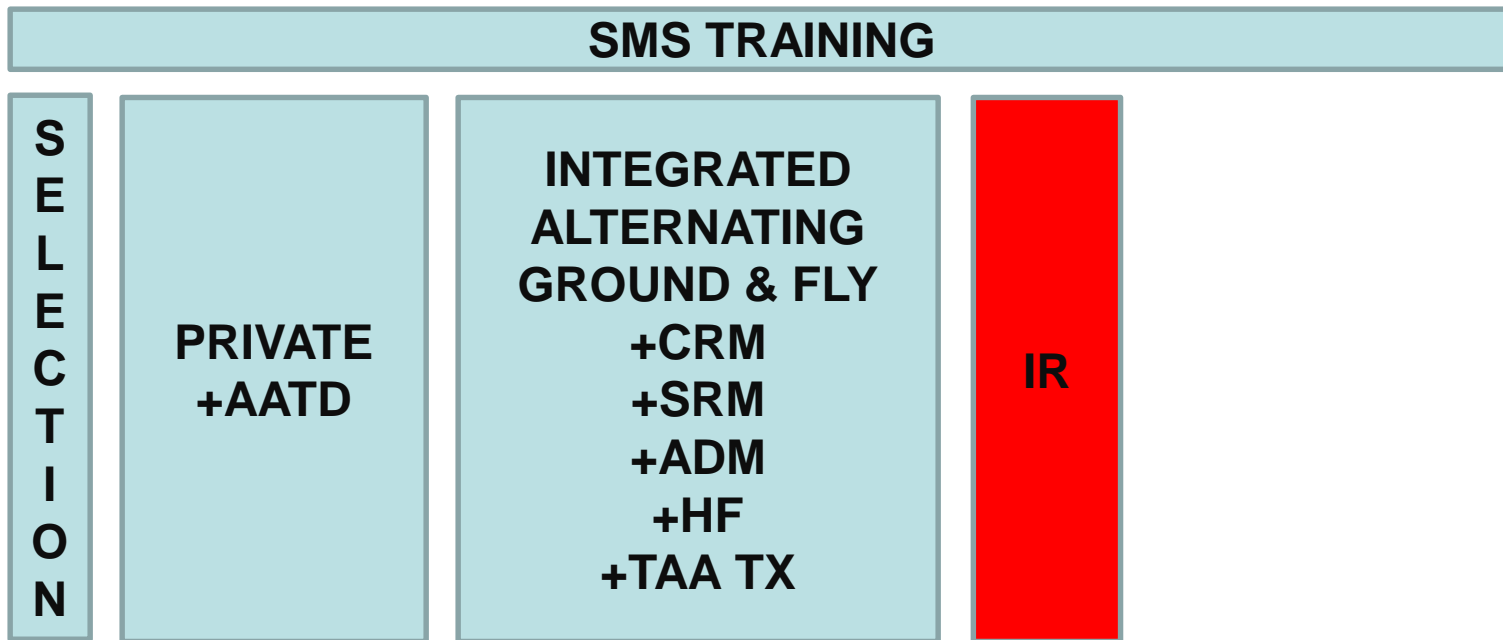
**PRIVATE  
+AATD**

**INTEGRATED  
ALTERNATING  
GROUND & FLY**

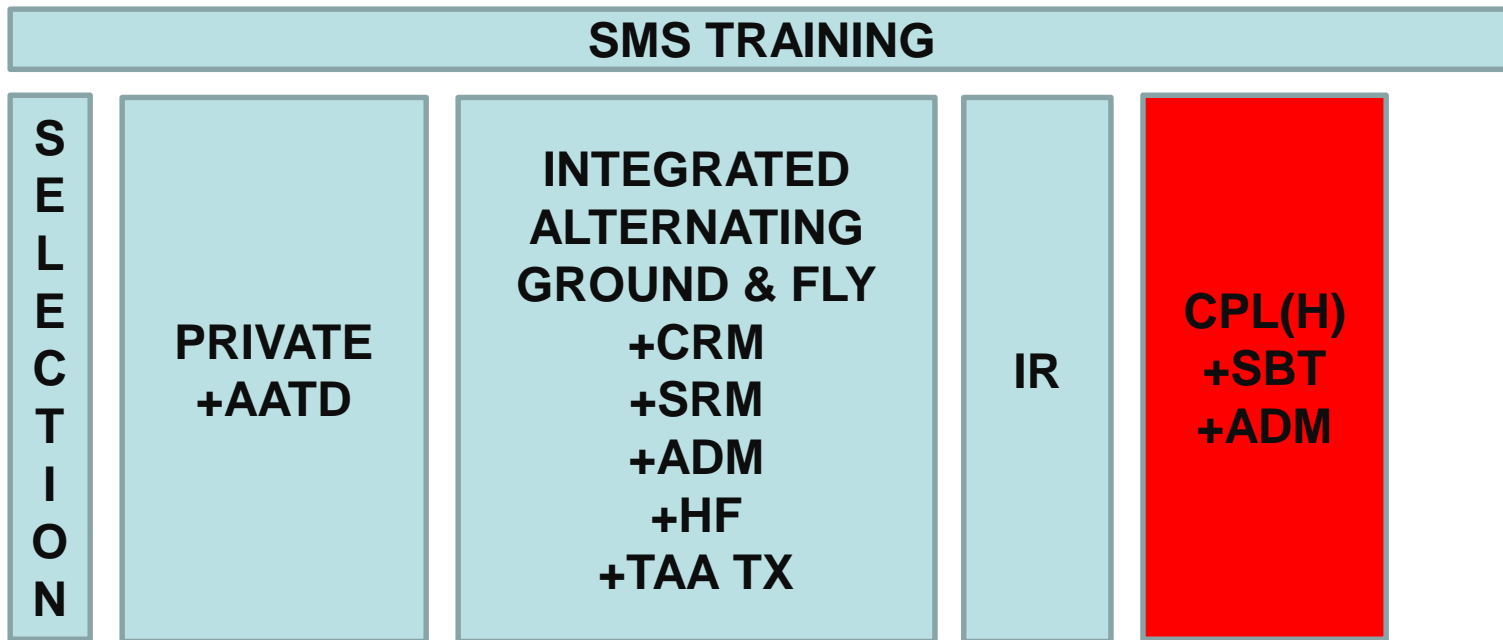
**+CRM  
+SRM  
+ADM  
+HF  
+TAA TX**

**Train SMS from day One!**

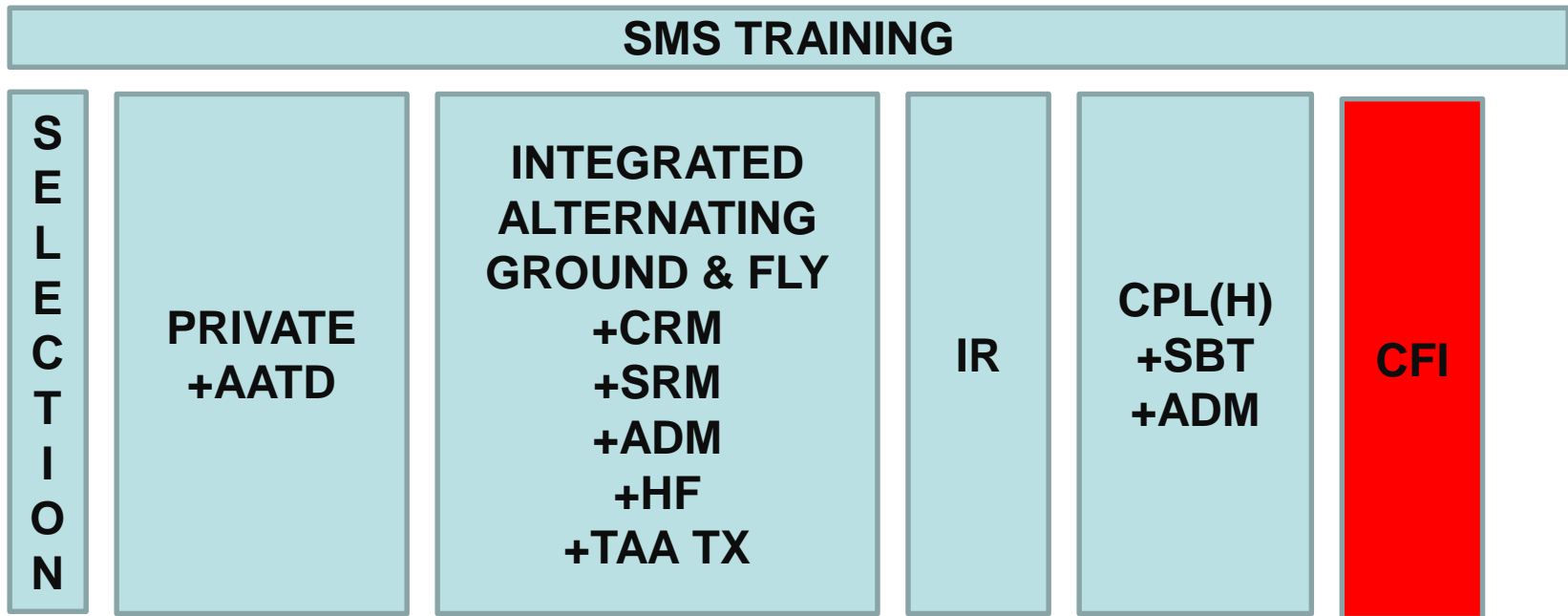
**Instrument Rating – increased use of FTDs.**



**Commercial Training—use FTDs to introduce SBT and develop ADM.**

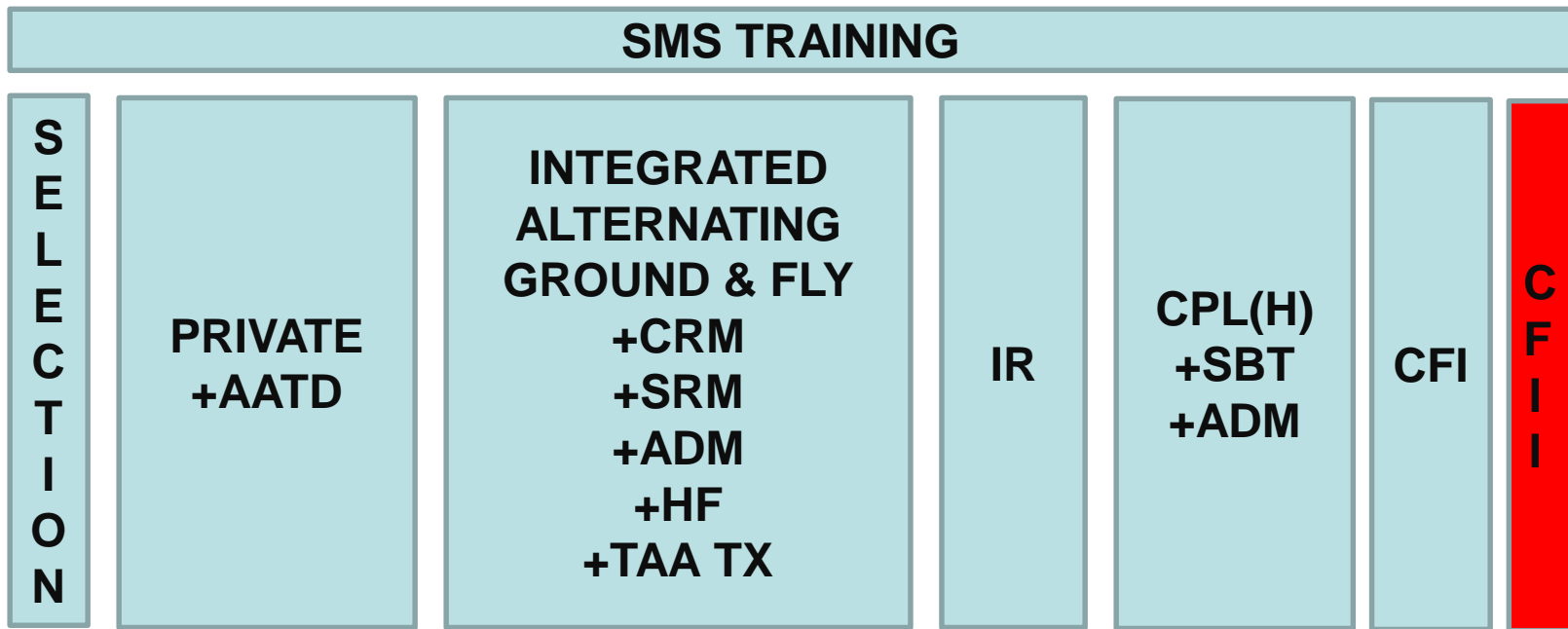


## CERTIFIED FLIGHT INSTRUCTOR





## CERTIFIED INSTRUMENT FLIGHT INSTRUCTOR (CFII)

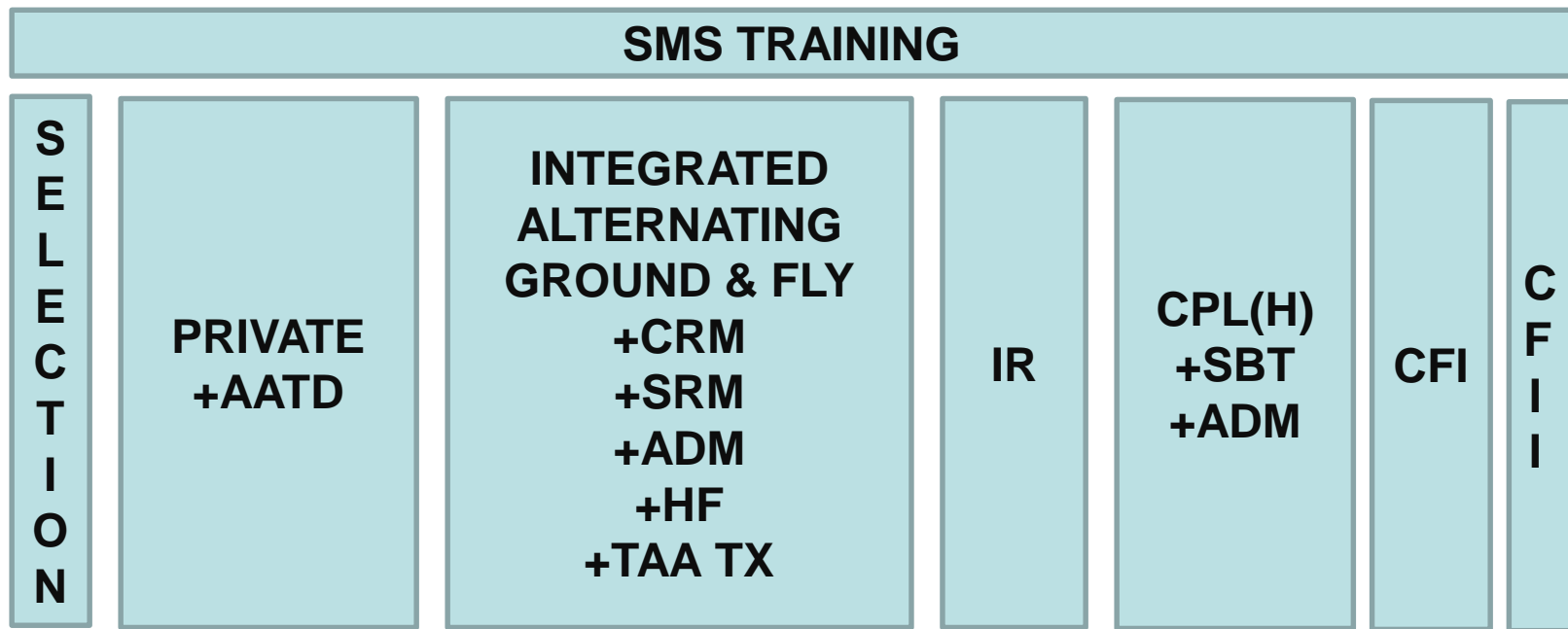




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## THE SUPER HERO HELICOPTER PROFESSIONAL PILOT COURSE



## The Training Device – Helicopter and FTD?

- What does this look like?
- Training Helicopter characteristics:
  - Forgiving.
  - No design specific features.
  - Supports primacy!
- Synthetic Devices:
  - Realistic.
  - Designed for purpose – generic is OK to teach generic skills.
  - Higher fidelity for IR and Commercial SBT/ADM Training.

## Example of Airmanship Education Research Initiative (AERI) Study – Dr Bill Rhodes PhD.

- DoD, DARPA, USAF Academy.
- 108 participants (Pvt-ATP)
- 2 Scenarios (VFR into IMC, Fuel Leak)
- 2 FTDs, 2 Groups.
- FAA ADM & Trustworthy Pilot on-line courses in between.
- Pilots with good ADM skills performed well in both scenarios.
- Pilots who made ADM errors in first scenario were significantly reduced in second scenario and they learned from their mistakes.

## Pipeline into the Industry

- What happens after training?
- CFI/CFII not always necessary.
- Conversion to operational aircraft? Twin engines? US Army and UK Military now training ab initio in twins!
- SIC positions? Are they available? Industry and insurance carriers needs to participate. SMS!

## Conclusion

### How do we grow new licensed professional helicopter pilots?

- Establish Training Centers of Excellence.
- Build true ab initio course immersed in a safety culture from Day One.
- Incorporate simulator training early in the pipeline
- Consider Competency and Evidence Based Training
- Use an integrated and SBT approach to train in HF, TEM, CRM, SRM and ADM.

SIC progression with industry and insurers participation for low hour SICs.



**Lastly**

**USHST Goal is to Reduce Fatal Accidents by 20% by  
2020**

**But its Vision is Zero Accidents**

**Can we achieve zero accidents?**

- **41,598**

- Rotorcraft Pilots in the US (Feb 16)

- **116**

- Rotorcraft Accidents in the US in FY16  
(Oct 15 - Sep 16)

- **41,482**

- Zero Accident rotorcraft pilots in US in FY16



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# Zero Accidents

## Believe it....

## To Achieve it.







# Questions and Discussion



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