

# Tilt-rotor UAV System to Monitor Illegal Fishing

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## ■ Introduction

- ❖ Tilt-rotor Family of KARI
- ❖ Merit of Tilt-rotor
- ❖ Innovative Concept of TR-60 WE

## ■ R&D and Operation Plan

- ❖ R&D Roadmap
- ❖ Development for Civil Operation

## ■ Conclusions

# Tilt-Rotor Family of KARI



TR-100 (Smart UAV)



TR-60



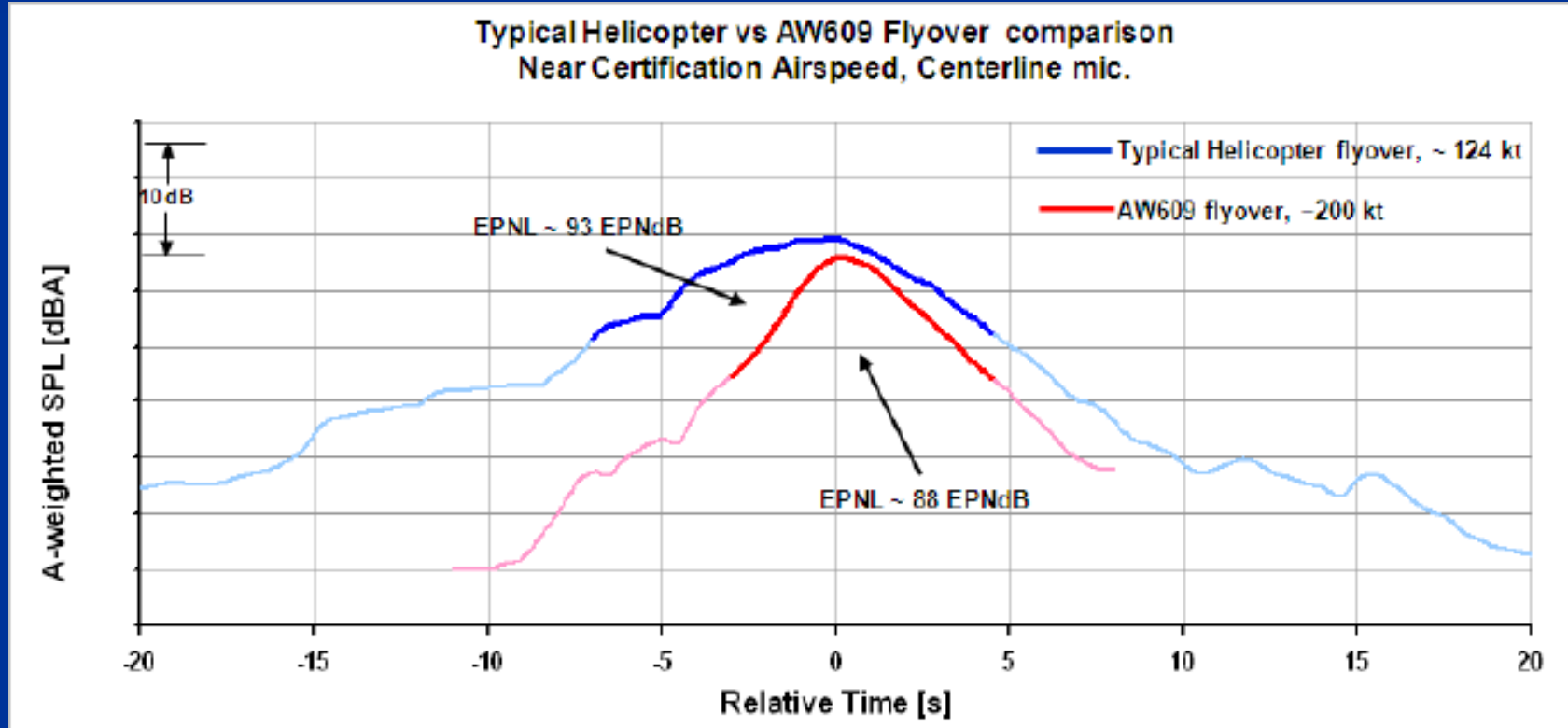
TR-40

TR-100 Smart UAV

TR-60

## ■ Comparison to Helicopter

- ❖ Can Fly Faster, Higher, and Farther
- ❖ even More Quietly



# Concept of TR-60 WE



TR-60 + Wing Extension

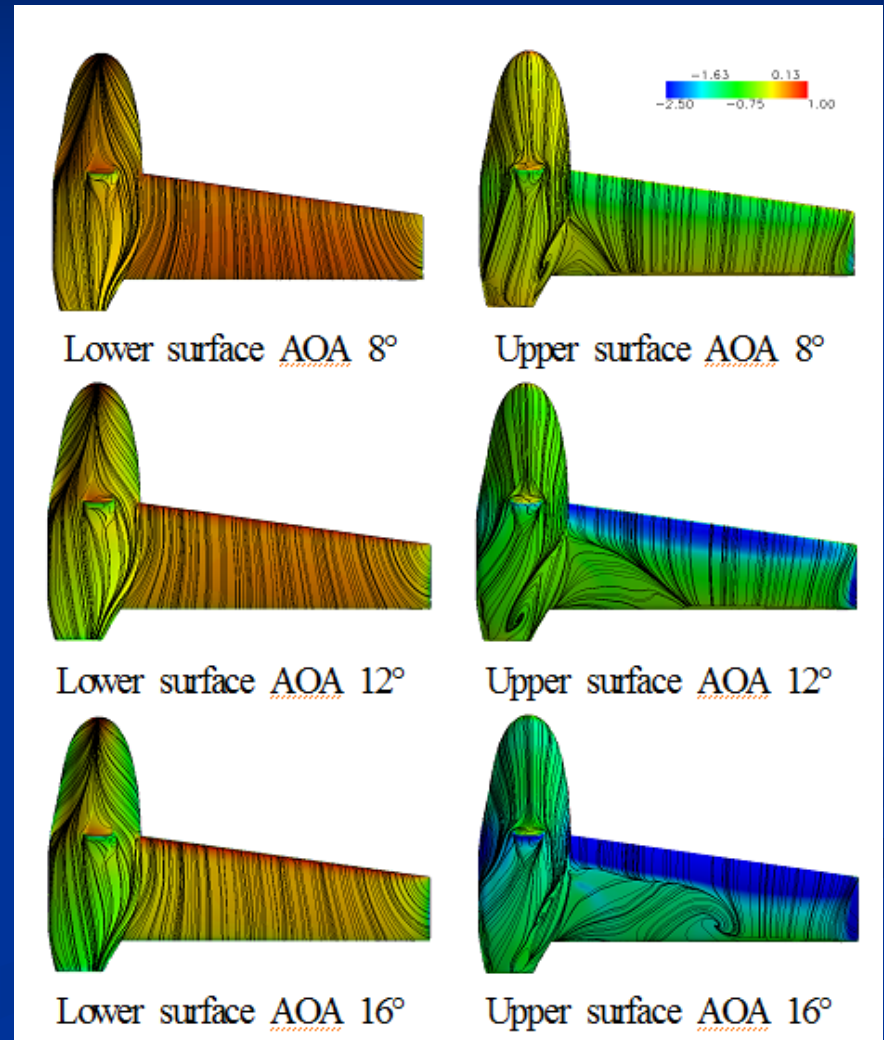
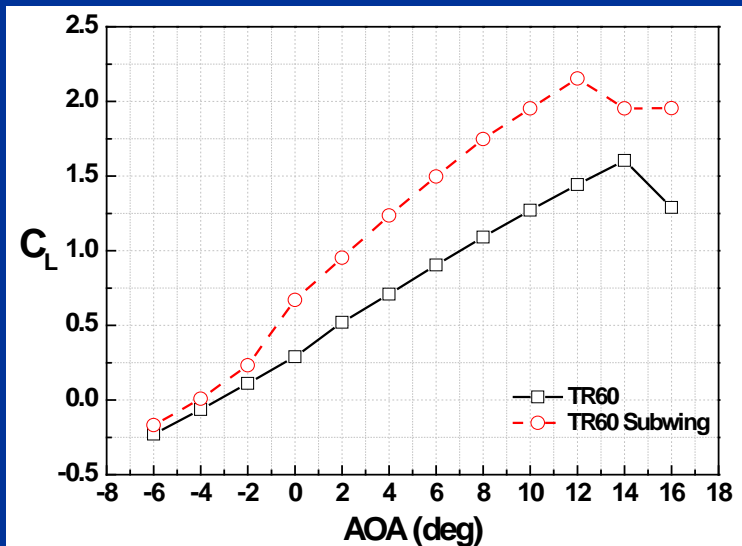
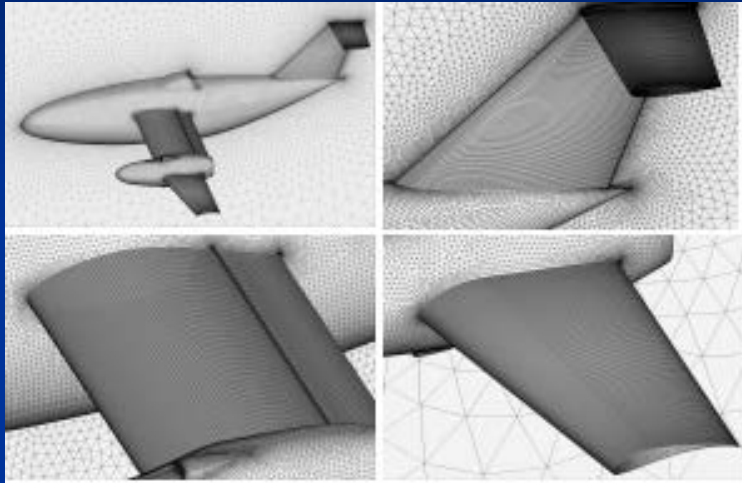


TR-60 WE

# TR-60 vs TR-60 WE

	TR60	TR60 WE
MTOW (kg)	200	same
Payload (kg)	20	same
Powerplant	55hp Rotary	same
Overall Length (m)	3.0	same
Wing Span (m)	3.0	4.8
Wing Area (m <sup>2</sup> )	1.5	2.0
Rotor Radius (m)	1.1	same
Blade Twist (deg)	29.0	same
Disk Loading (kg/m <sup>2</sup> )	52.6	same
Max Speed (km/h)	240.0	220
Loitering Speed (km/h)	160.0	140.0
Max Altitude (km)	4.0	same
Endurance (hrs)	5.0	6.0
Fuselage	Upswept aft fuselage	same
Landing Gear	3 pts fixed tricycle	same

## Flow Visualization



# Flight Control System

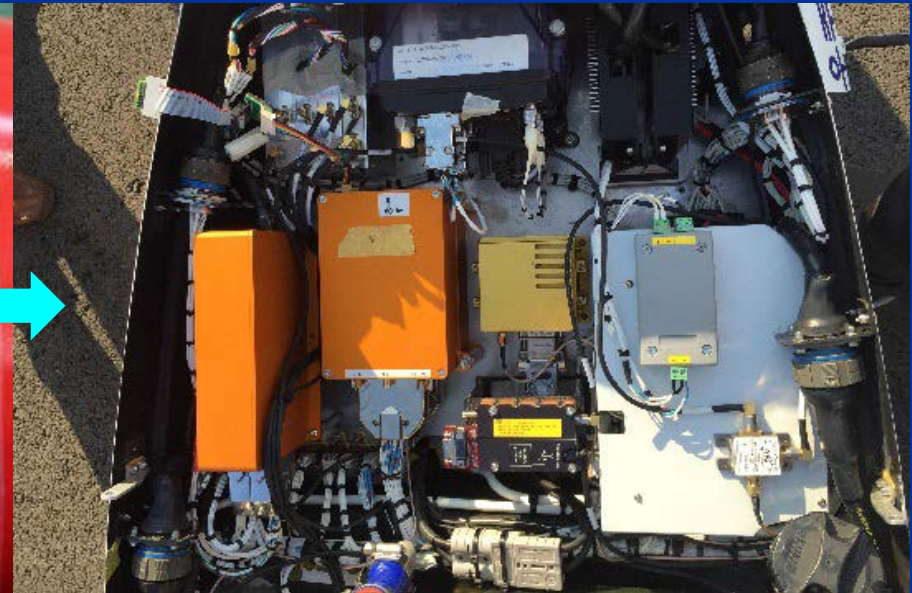
## ■ Upgrade of Flight Control Hardware

Avionics Bay of TR-60



- Hardware come from TR-100
- Communication Range < 5km
- GPS/INS

Avionics Bay of TR-60 WE



- Optimized for TR-60 Series
- Communication Range < 50km (~ 200km)
- Relative GPS/INS for Deck Operation

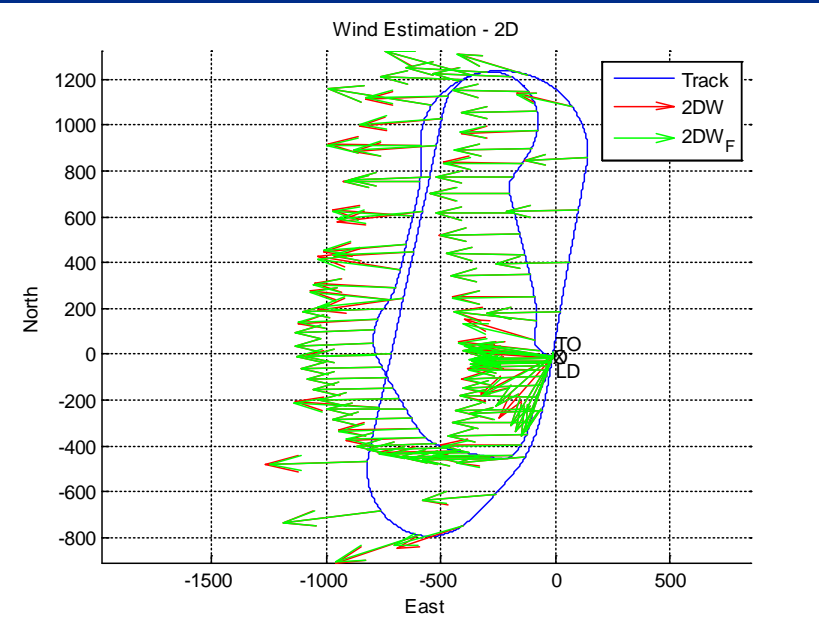


## ■ Flight Test Results

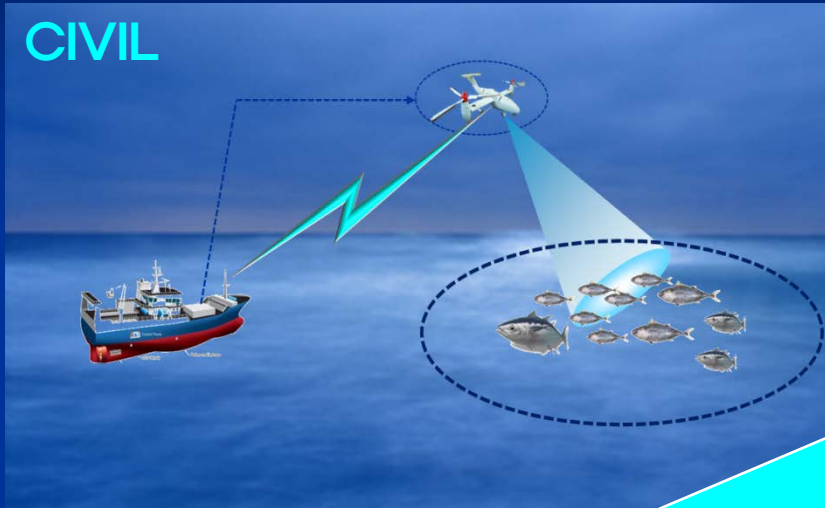
Preprogram on a map



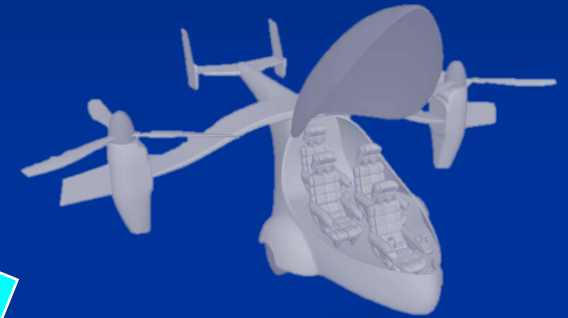
Trajectory and wind estimation



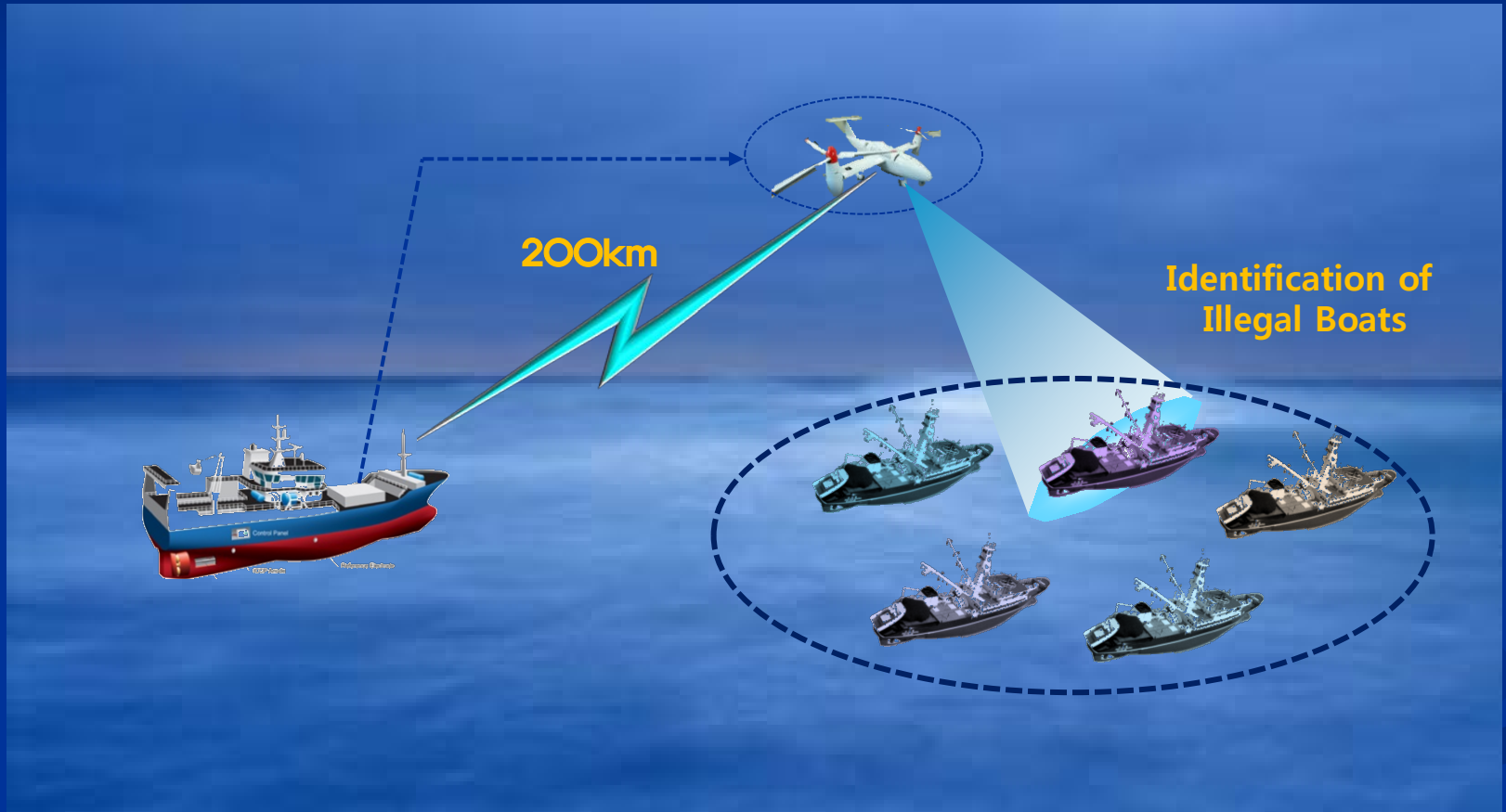
## Development Plan



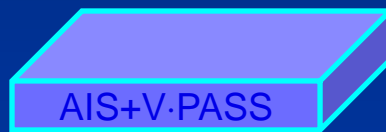
## Personnel Air Vehicle



## ■ Monitor Illegal Fishing



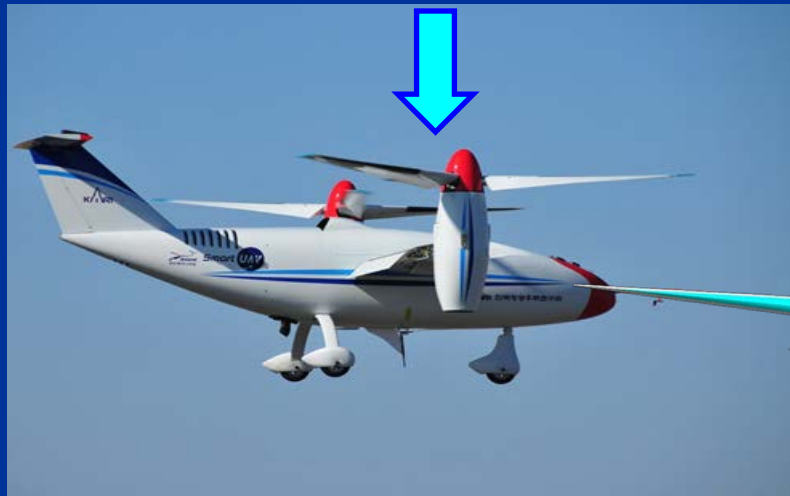
## ■ Monitor Illegal Fishing



Integrated Small/Light Weight Identification System

Improved Video Display

Electronic Mapping Display



Data Link Interface Development



## ■ Accomplishments

- ❖ TR-60 WE was successfully developed
  - ✓ To increase endurance in airplane mode
  - ✓ World 1<sup>st</sup> design concept for performance enhancement of tilt-rotor
- ❖ Series of Tilt-rotor UAV showed the possibility of Commercial Operation
  - ✓ TR-40
  - ✓ TR-100
  - ✓ TR-60 and TR-60WE

## ■ Next Plans

- ❖ Co-Development of production type TR-6X with Korean Air
- ❖ TR-80 will be considered for another Production Type
- ❖ Initial operation of TR-60 to monitor illegal fishing

Thank you for your attention !

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