



Peluang Airlines dalam Pemanfaatan Drone di Indonesia

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Garuda Indonesia: Cargo Strategy

CHALLENGES

E-Commerce

Capacity

Connectivity

Technology

VISION & MISSION

**Integrated Air Cargo Operator & Logistics Provider
to Connect Nation Wide Cargo Potentials to the
World's Market**

STRATEGIC DIRECTION

GO-FREIGHTER

Develop cargo freighter to response e-commerce and improving capacity

GO-LOGISTICS

Seamless Logistics improvement by develop logistics hub facilities

GO-EXPRESS

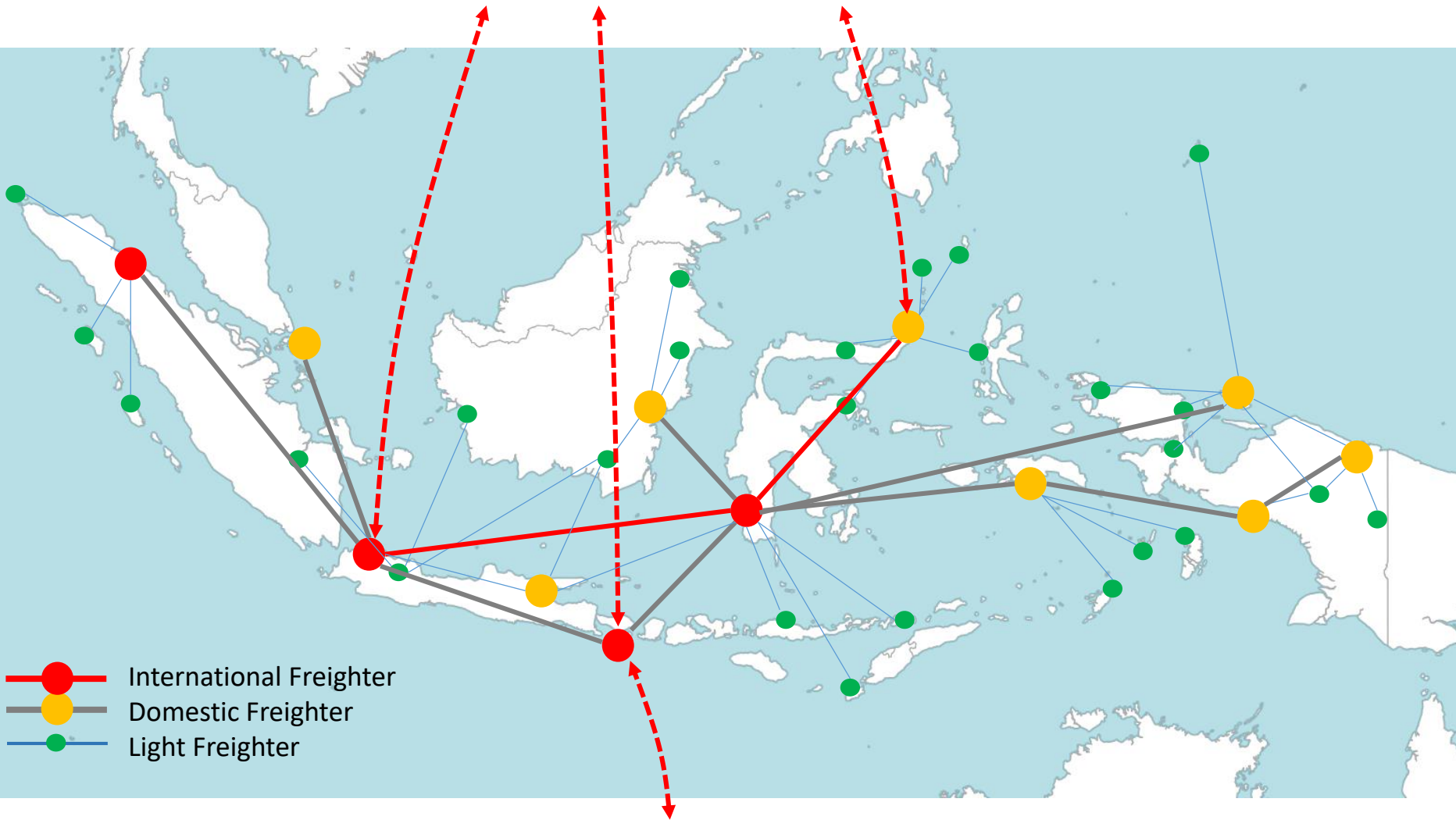
Improving first miles and last miles services to enhance delivery speed to customers

GO-EXCELLENT

Develop Integrated Cargo System and Develop New Cargo Technology

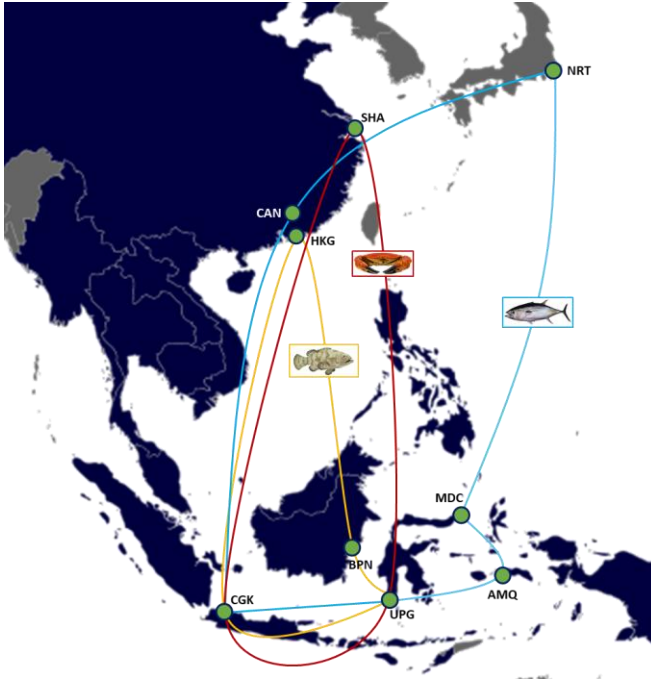
Mission :

Connecting Nation Wide Logistics within 24 Hour



Go-Freighter

Freighter development route, to increase capacity and connectivity of Indonesian export commodities to the world.

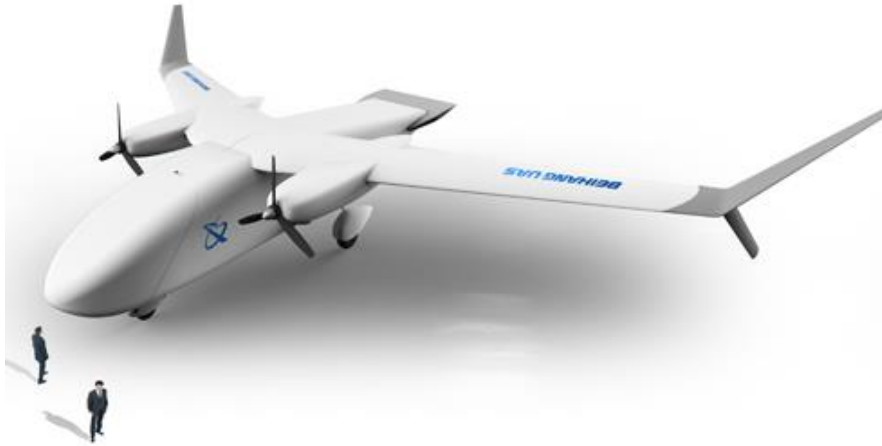


Aircraft	Load Capacity	Deployment	Route
B-737-300	15,000 kgs	January 2019	Domestics
B-737-400	18,000 kgs	July 2019	Domestics & Regional
B-737-800 (2)	23,000 kgs	Q1 2020	Indonesia-Hongkong-China
A-330-300 (2)	60,000 kgs	Q2 2020	Indonesia-Japan-USA

Will adding capacity 300 million kgs per year

Light Freighter : Drone-UAS Technology

Unmanned Aerial System



Project Beihang UAS 2019

Connecting Cargo Hub & Spoke

Cargo capacity : 2.2 ton

Cruising range ;

Cruising Speed : 300 km/h

Cruising Altitude : 5000 m

Endurance : 4 hours

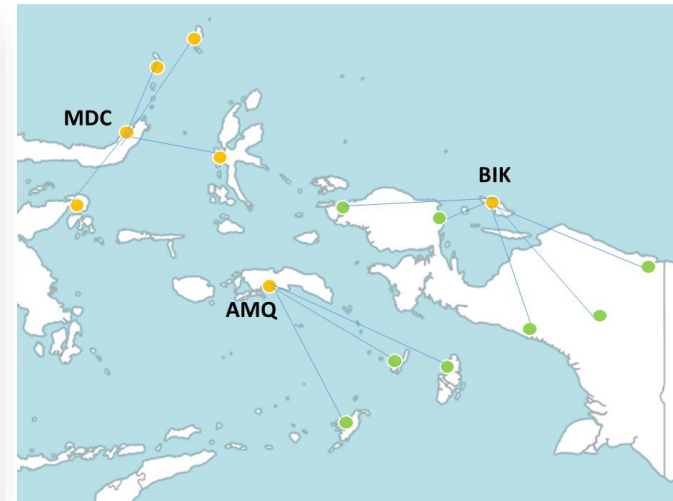
Range : 1200 km

T/L Distance : 600-1000m

**2 Unit BZK-005 for
Trial Operation**



Trial Plan : September – December 2019



Why UAS Technology for Indonesia ?

Economical Advantage

- Low cost for purchasing and operating
- Sufficient capacity 2.2 Ton, 18 cubic meter with 7D 24H working
- Air and land joint operation
- 30% lower air freight cost

Technical Advantage

- Short runway for take-off and landing capability
- Lower risk with unmanned
- Experienced with already serving China military for 10 years

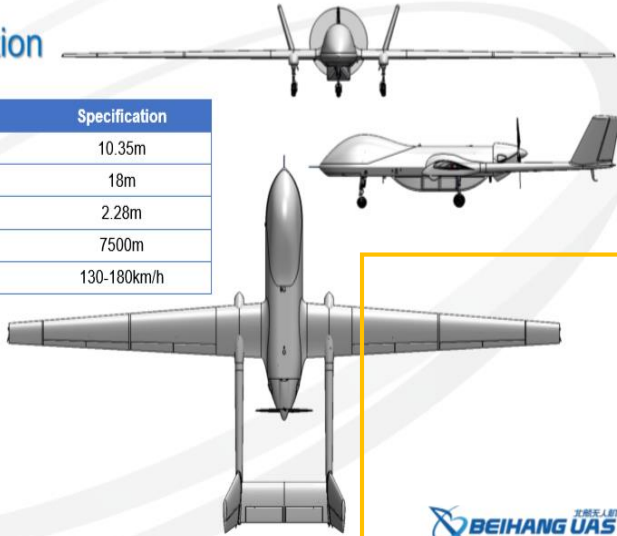
Sustainable Strategy

- Suitable to operate in archipelago country
- No barrier for distributing goods to all domestic destination
- Connecting nationwide air cargo network within 24 hours

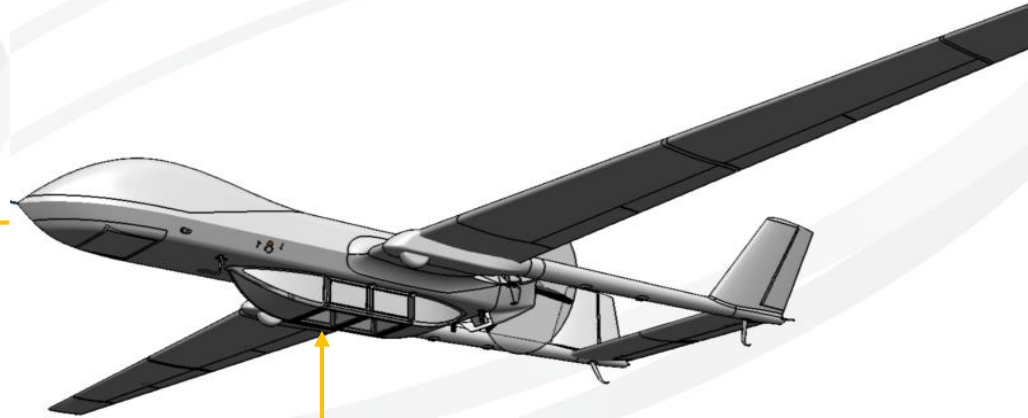
Trial Operation Plan : 2 unit TYW-1YG

Configuration

Item	Specification
Length	10.35m
Wingspan	18m
Height	2.28m
Ceiling	7500m
Cruising Speed	130-180km/h



BEIHANG UAS



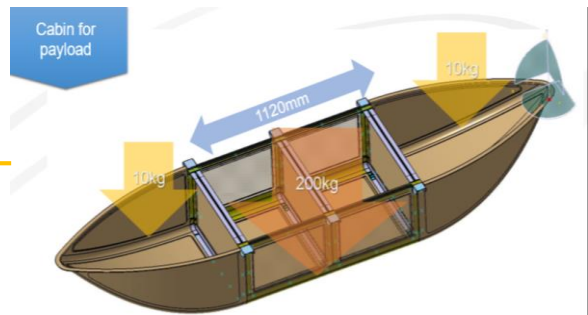
Ground System TYW-1YG



Data Link

Ground Control Station

Satellite Communication

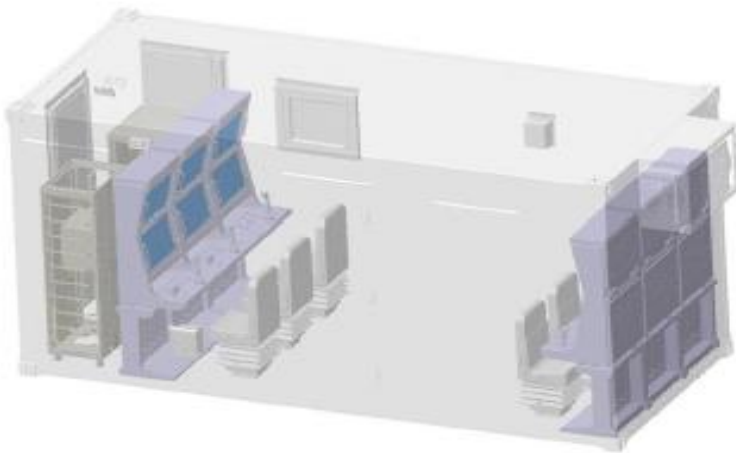


Trial Operation Plan:

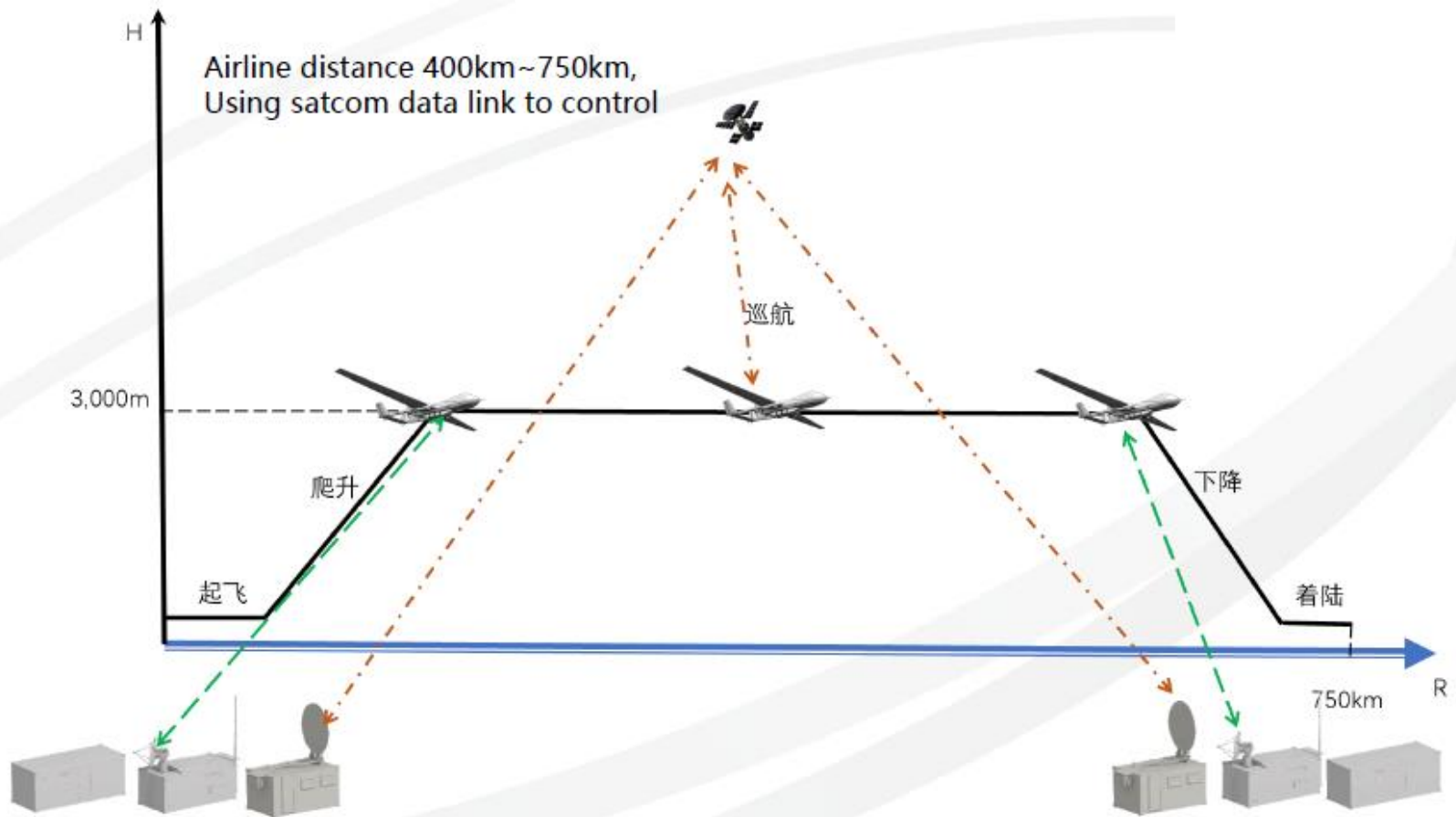
Integrated Ground Control Station & HR



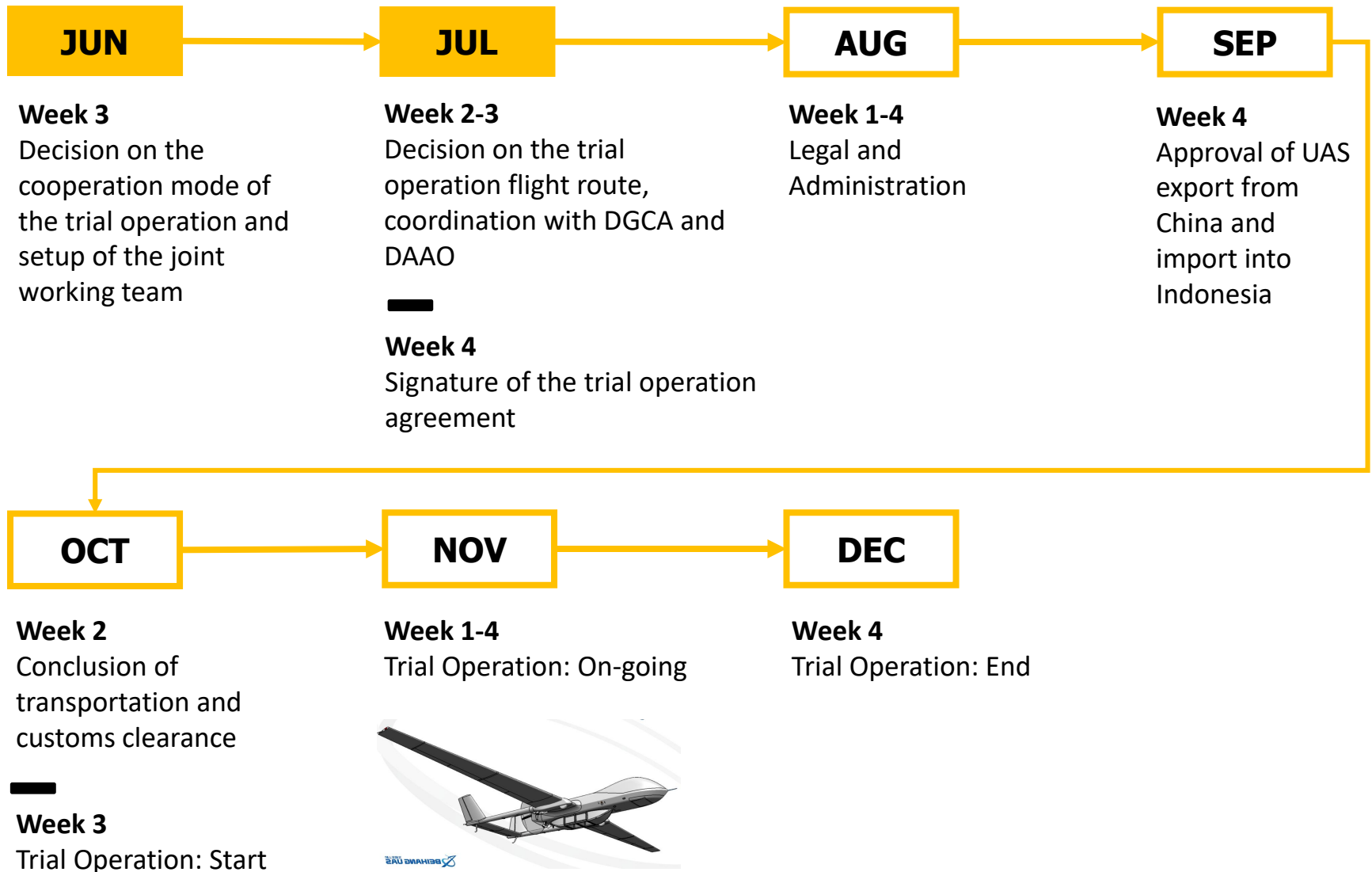
HUMAN RESOURCES		For 1 System	Minimum Subtotal	Best Subtotal
Operation & Maintenance	Flight Commander	1	2	2
	Flight Operator	1	2	4
	Datalink Operator	1	2	4
	Maintenance	4	8	8
Technical Support	Power	1	2	2
	Electric	1	2	2
Total Quantity		9	18	22



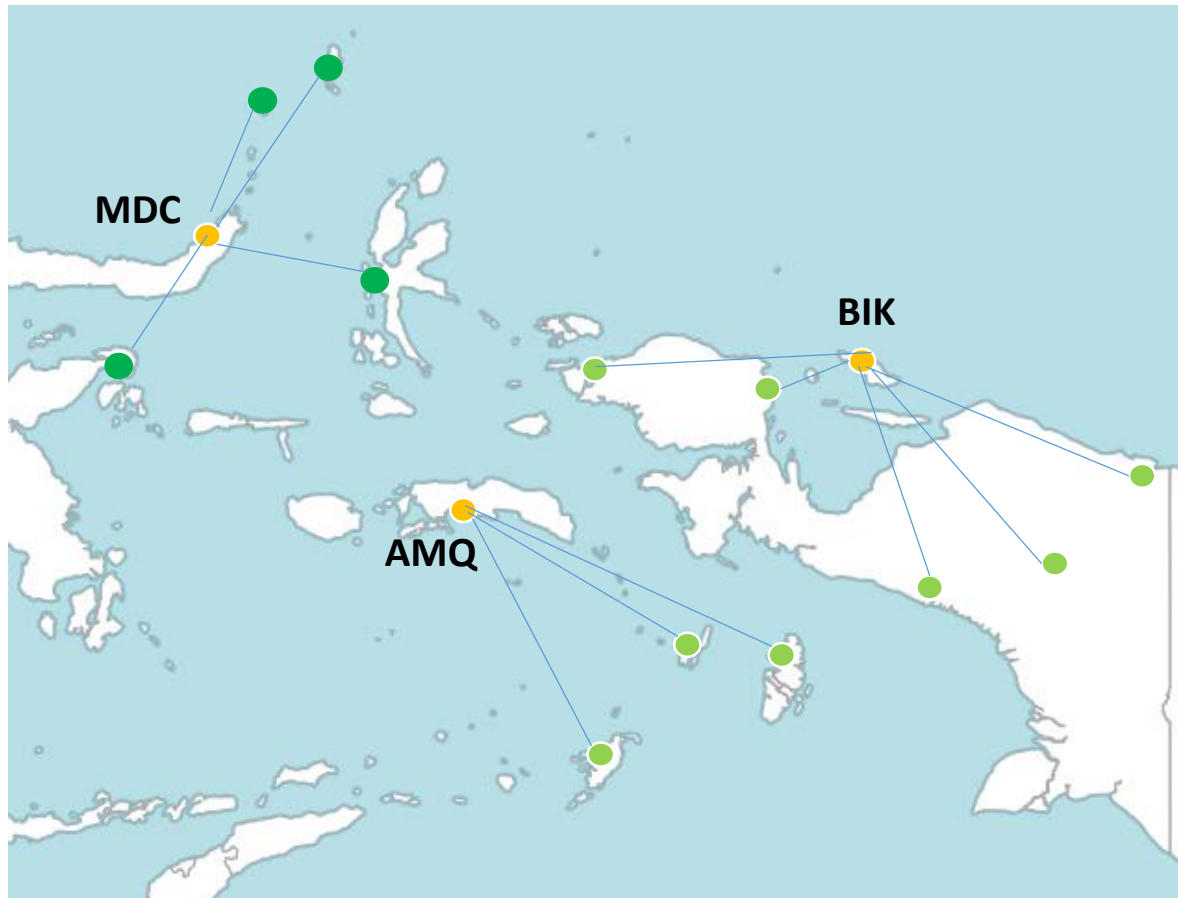
Communication System



Trial Operation Plan : Time Frame



Trial Operation Plan : Route Plan



AMQ – DOB	: 716 km
AMQ – SXX	: 592 km
AMQ – LUV	: 558 km
BIK – DJJ	: 519 km
BIK – SOQ	: 537 km
BIK – WMX	: 451 km
BIK – TIM	: 379 km
BIK – MKW	: 231 km

Gap Analysis: Airworthiness Side

Current Condition

- Regulation CASR 107 only for UAS less than 55lbs (25kg)
- Regulation CASR 21.193 and CASR 91.319 for R&D, crew training, market surveys and production flight testing

Future Condition

- Regulation for UAS to accommodate MTOW more than 5.6 Ton
- Regulation for UAS to Conduct Commercial Cargo Operation

Gap

- No Airworthiness Standard for UAS (CASR 21, 23, 27)
- No Pilot License for UAS (CASR 61 Remote Pilot License)
- No Surveillance Procedure
- No Regulation for Remote Pilot Training Center

Action to Close The Gap

- Propose to utilize CASR 91.319 for Trial Operation
- DGCA with UAS manufacturer together develop regulation
- DGCA with other CAA (FAA/EASA/CAAC) harmonize regulation standard applicability for UAS both airworthiness and operational side
- Refer to ICAO Doc 10019: RPAS

Gap Analysis: Operational Side

Current Condition

- Regulation CASR 107.51 limiting speed small UAS for 87 knots
- PM 180/2015 only for uncontrolled airspace below 500 ft
- Visual operation based on CASR 107.29

Future Condition

- Regulation CASR 107.51 accommodate speed for UAS more than 150 knots
- Operate in Controlled Airspace up to FL 250 (25,000 ft)
- Operate in IFR (instrument flight rules) condition

Gap

- No specific airports for UAS
- No regulation for mixed airspace between UAS and Conventional A/C
- No regulation for standard operation (UAS more than MTOW 5.6 Ton)

Action to Close The Gap

- DGCA with UAS manufacturer work together for standard regulation for operational
- Develop existing airports for UAS capability
- Propose to have regulation for mixed airspace

Trial Requirements: Administration Document

REGULATOR	REQUIREMENT	RESPONSIBILITY	STATUS
AIRNAV	Take-off/Landing procedure	BEIHANG	In Progress
	Surveillance UAS	BEIHANG	In Progress
	Airspace of UAS in China (mix or separated)	BEIHANG	In Progress
	Document trial/flight permit of UAS in China	BEIHANG	In Progress
	Radio communication procedure between ground control and ATC	BEIHANG	In Progress
DAAO	UAS Registration Document for Trial (China Registration)	BEIHANG	In Progress
	Security Clearance (SC) to Indonesian Military (Eng. Min lvl 4)	BEIHANG	In Progress
	UAS License, Manufacturer Certification, Ops. Spec Document for UAS (Trial and Commercial)	BEIHANG	In Progress
	Transponder Equipment	BEIHANG	In Progress
DGCA	Letter to Ministry of Transportation for Trial Permit and Legal	GARUDA	Done
	Proposal for Trial Operation	GARUDA & BEIHANG	In Progress
	Technical Feasibility Study & GAP analysis	GARUDA	Done
	Representative company (head office) document	GARUDA & BEIHANG	In Progress

Points of Discussion from DIRNAVPEN Meeting (9 July 2019)

Stakeholders	Important Notes
1. LPPNPI (AirNav)	Perum LPPNPI akan melaksanakan safety assessment sebelum pelaksanaan uji coba operasional drone di bandara yang ditentukan
2. DKPPU	<ul style="list-style-type: none"> Saat ini belum ada regulasi yang mengatur tentang penggunaan drone ini dikarenakan dinegara asalnya digunakan sebagai kebutuhan militer, untuk regulasi manufacturing yang dipakai akan mengacu CASR part 23 Butuh adanya dokumen yang valid dari CAA China salah satunya adalah registrasi. RPAS yang melebihi berat 55 (lima puluh lima) lbs yang digunakan untuk penelitian dan pengembangan, kru training dan market surveys harus memiliki experimental certificate mengikuti CASR subpart 91.319.
3. DBU	<ul style="list-style-type: none"> Perlu dilakukannya Gap analisis sebagai proposal kepada Dirjen Perhubungan Udara. Lokasi ground control agar dipindahkan sehingga tidak masuk dalam zona runway strip.
4. DIRKAMPEN	Fasilitas di lokasi trial harus mengikuti requirement yang dibutuhkan dalam suatu penerbangan seperti di area apron dan stasiun pengisian bahan bakar.
5. DAU	Perlu adanya perwakilan Beihang di Indonesia sebagai head office untuk pengawasan drone.
6. DIRNAVPEN	Teknologi drone sebenarnya sudah ada dimana-mana dan sudah berjalan juga di Indonesia seperti untuk foto udara, videografi dan lain-lain namun teknologi untuk kepentingan kargo baru ada, sehingga pemerintah perlu bersiap diri untuk menghadapi tantangan yang ada seperti teknis pengoperasiannya, sistem komunikasinya, surveillancenya dan regulasinya.

Recommendation for Trial Operation

1. For Trial Operation, Garuda propose to utilize existing regulation on CASR 91.319
2. Refer to ICAO Doc 10019: RPAS (Remotely Piloted Aircraft Systems)
3. DGCA with UAS manufacturer will be together develop a standard regulation for operational of UAS
4. Propose to have a regulation for mixed airspace between UAS and Conventional A/C
5. All points above are subject to approval by the Authority

UAS - Flying Demo



UAS - Flying Demo



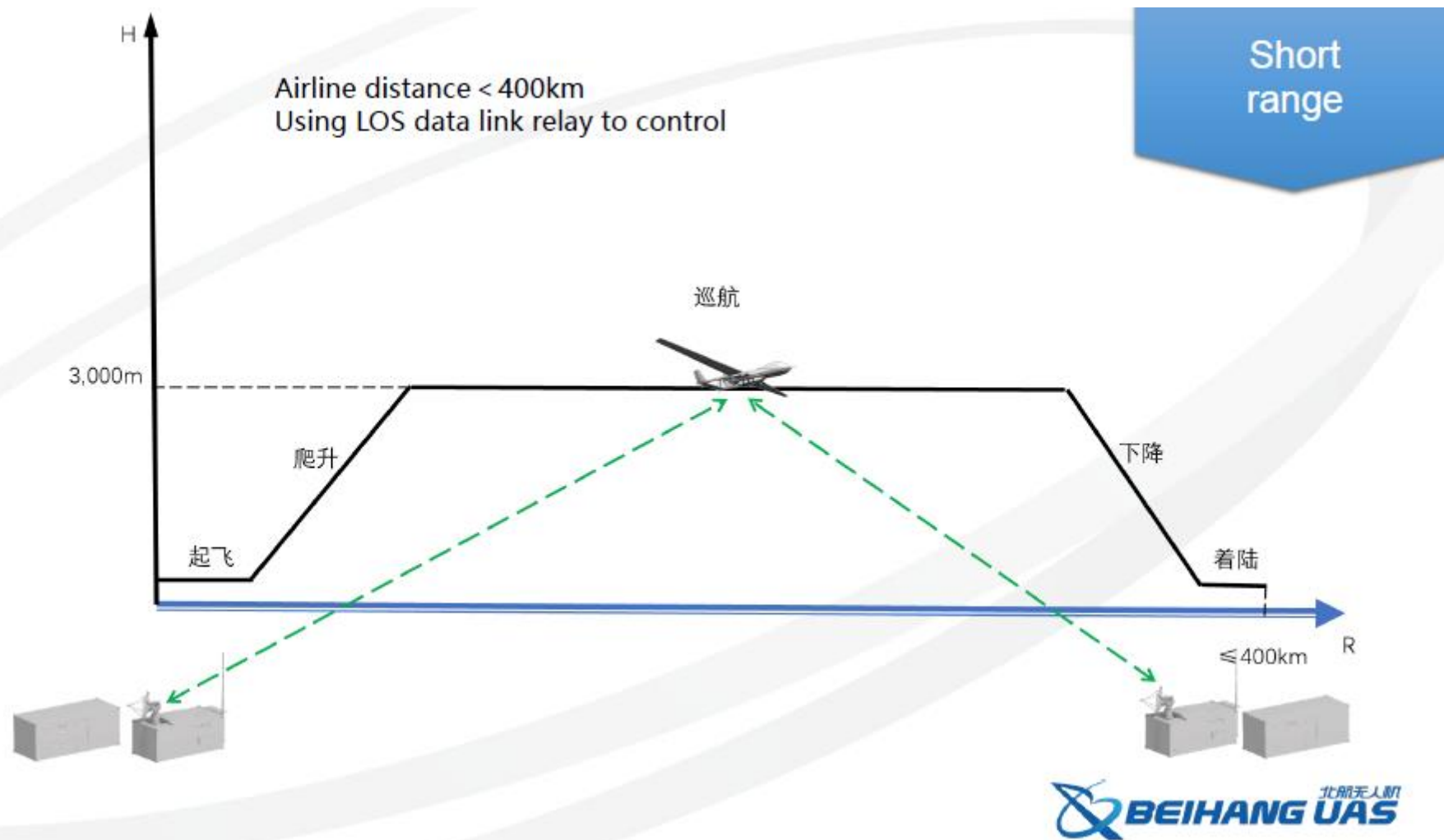


Thank You

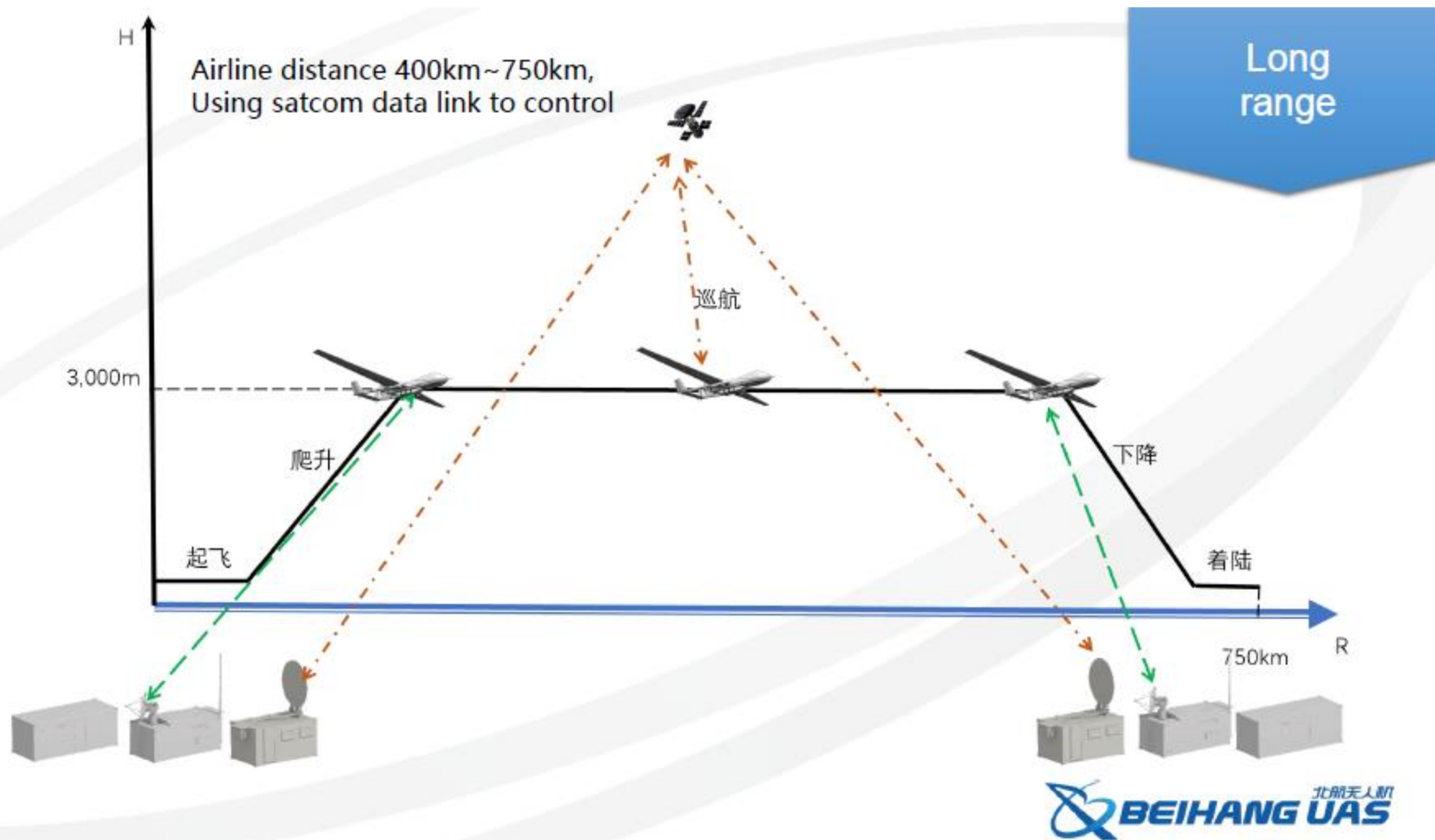
1 FAMILY
NATION
GARUDA INDONESIA



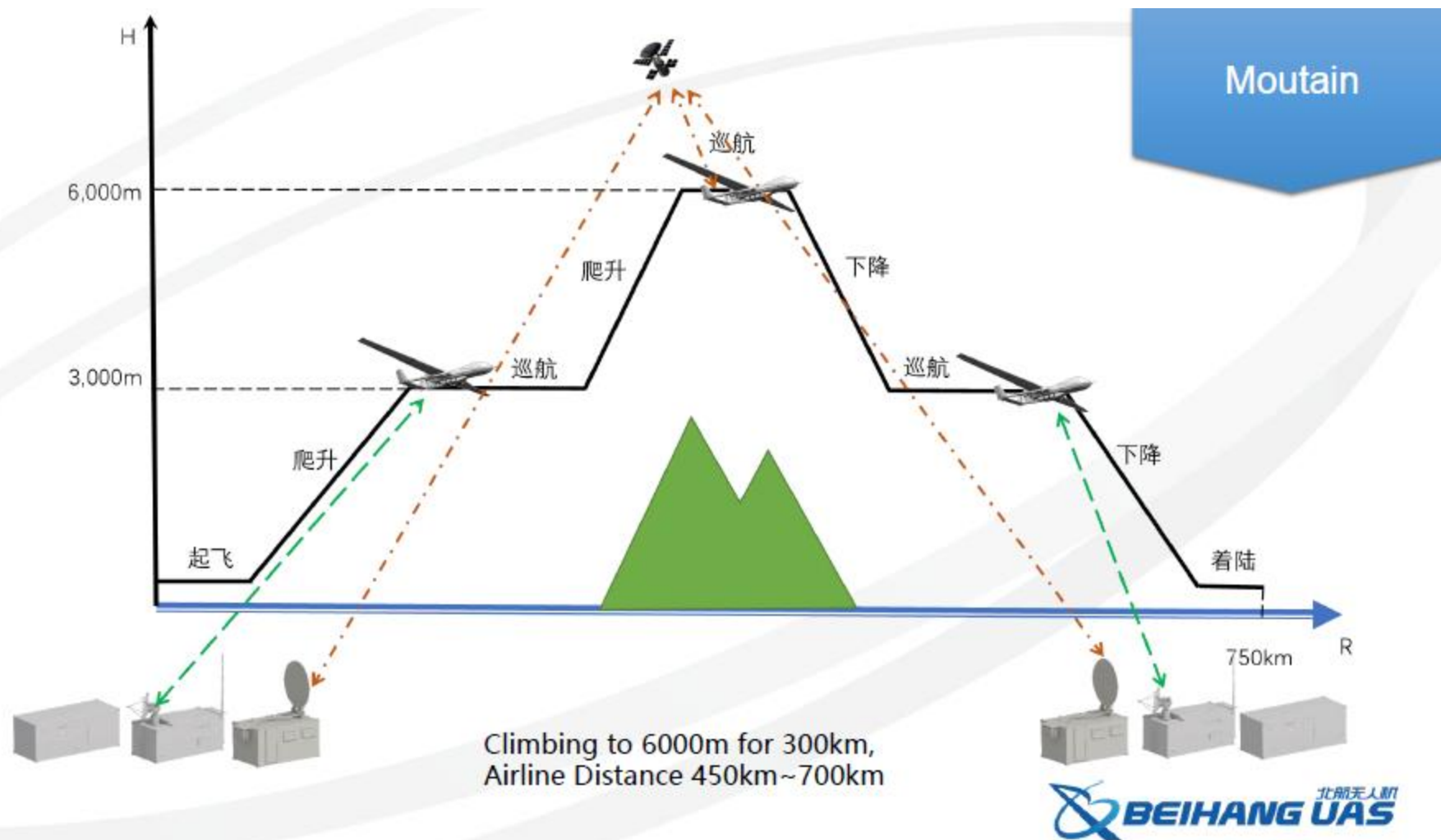
ATC: Short Range



ATC: Long Range



ATC: Mountain



CASR 121.193

21.193 Experimental Certificates: General.

An applicant for an experimental certificate must submit the following information:

- (a) A statement, in a form and manner prescribed by the DGCA setting forth the purpose for which the aircraft is to be used.
- (b) Enough data (such as photographs) to identify the aircraft.
- (c) Upon inspection of the aircraft, any pertinent information found necessary by the DGCA to safeguard the general public.
- (d) In the case of an aircraft to be used for experimental purposes -
 - (1) The purpose of the experiment;
 - (2) The estimated time or number of flights required for the experiment;

CASR 91.319

91.319 Aircraft Having Experimental Certificates: Operating Limitations

- (a) No person may operate an aircraft that has an experimental certificate__
 - (1) For other than the purpose for which the certificate was issued; or
 - (2) Carrying persons or property for compensation or hire.

- (b) No person may operate an aircraft that has an experimental certificate outside of an area assigned by the Director until it is shown that_
 - (1) The aircraft is controllable throughout its normal range of speeds and throughout all the maneuvers to be executed; and
 - (2) The aircraft has no hazardous operating characteristics or design features.

- (c) Unless otherwise authorized by the Director in special operating limitations, no person may operate an aircraft that has an experimental certificate over a densely populated area or in a congested airway. The Director may issue special operating limitations for particular aircraft to permit takeoffs and landings to be conducted

CASR 107.51

107.51 Operating limitations for small unmanned aircraft.

An operator must comply with all of the following operating limitations when operating a small unmanned aircraft system:

- (a) The airspeed of the small unmanned aircraft may not exceed 87 knots (100 miles per hour) calibrated airspeed at full power in level flight;
- (b) The minimum flight visibility, as observed from the location of the ground control station must be no less than 3 statute miles (4.8 kilometers); and
- (c) The minimum distance of the small unmanned aircraft from clouds must be no less than:
 - (1) 500 feet (150 meters) below the cloud; and
 - (2) 2,000 feet (600 meters) horizontally away from the cloud.

3. Ketentuan khusus pengoperasian sistem pesawat udara tanpa awak

- 3.1. Pengoperasian sistem pesawat udara tanpa awak kecil dengan berat tidak lebih 55 *lbs* dan digunakan untuk keperluan selain hobi atau rekreasi wajib memenuhi ketentuan Peraturan Keselamatan Penerbangan Sipil Bagian 107 / *Civil Aviation Safety Regulation (CASR) Part 107*.

PM 180/2015

- 2.3. Sebuah sistem pesawat udara tanpa awak tidak boleh dioperasikan pada ruang udara yang dilayani sebagai berikut:
 - 2.3.1. *Controlled airspace.*
 - 2.3.2. *Uncontrolled airspace* pada ketinggian lebih dari 500 ft (150 m) *Above Ground Level (AGL).*

- 2.4. Kawasan sebagaimana dimaksud dalam butir 2.2.1. dan 2.2.2. adalah kawasan yang dipublikasikan di dalam *Aeronautical Information Publication (AIP) Indonesia Volume I General & En-route.*

PM 180/2015

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