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

International Freighter
Domestic Freighter
Light Freighter
Go-Freighter

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

<table>
<thead>
<tr>
<th>Aircraft</th>
<th>Load Capacity</th>
<th>Deployment</th>
<th>Route</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-737-300</td>
<td>15,000 kgs</td>
<td>January 2019</td>
<td>Domestics</td>
</tr>
<tr>
<td>B-737-400</td>
<td>18,000 kgs</td>
<td>July 2019</td>
<td>Domestics &amp; Regional</td>
</tr>
<tr>
<td>B-737-800 (2)</td>
<td>23,000 kgs</td>
<td>Q1 2020</td>
<td>Indonesia-Hongkong-China</td>
</tr>
<tr>
<td>A-330-300 (2)</td>
<td>60,000 kgs</td>
<td>Q2 2020</td>
<td>Indonesia-Japan-USA</td>
</tr>
</tbody>
</table>

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

Trial Plan : September – December 2019

2 Unit BZK-005 for Trial Operation
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

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>10.35m</td>
</tr>
<tr>
<td>Wingspan</td>
<td>18m</td>
</tr>
<tr>
<td>Height</td>
<td>2.28m</td>
</tr>
<tr>
<td>Ceiling</td>
<td>7500m</td>
</tr>
<tr>
<td>Cruising Speed</td>
<td>130-180km/h</td>
</tr>
</tbody>
</table>

Ground System TYW-1YG

Data Link

Ground Control Station

Satellite Communication
Trial Operation Plan: Integrated Ground Control Station & HR

<table>
<thead>
<tr>
<th>HUMAN RESOURCES</th>
<th>For 1 System</th>
<th>Minimum Subtotal</th>
<th>Best Subtotal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation &amp; Maintenance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flight Commander</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Flight Operator</td>
<td>1</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Datalink Operator</td>
<td>1</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Maintenance</td>
<td>4</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Power</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Electric</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Total Quantity</td>
<td>9</td>
<td>18</td>
<td>22</td>
</tr>
</tbody>
</table>
Communication System

Airline distance 400km~750km, Using satcom data link to control
**Trial Operation Plan: Time Frame**

**JUN**
- **Week 3**
  - Decision on the cooperation mode of the trial operation and setup of the joint working team

**JUL**
- **Week 2-3**
  - Decision on the trial operation flight route, coordination with DGCA and DAAO
- **Week 4**
  - Signature of the trial operation agreement

**AUG**
- **Week 1-4**
  - Legal and Administration

**SEP**
- **Week 4**
  - Approval of UAS export from China and import into Indonesia

**OCT**
- **Week 2**
  - Conclusion of transportation and customs clearance
- **Week 3**
  - Trial Operation: Start

**NOV**
- **Week 1-4**
  - Trial Operation: On-going

**DEC**
- **Week 4**
  - Trial Operation: End
Trial Operation Plan: Route Plan

- AMQ – DOB: 716 km
- AMQ – SXK: 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: on Potential Airport

<table>
<thead>
<tr>
<th>CHECK LIST</th>
<th>AMQ</th>
<th>DOB</th>
<th>SXK</th>
<th>LUV</th>
<th>BIK</th>
<th>DJJ</th>
<th>WMX</th>
<th>TIM</th>
<th>MKW</th>
<th>SOQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Runway requirement: Length 1000-1200m/Width 30m/40m (capability Takeoff/Landing of UAV = 600m)</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
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<td>V</td>
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<td>V</td>
</tr>
<tr>
<td>The size of the open space (used to lay out transport cases): recommended to be larger than 12m x 2.4m x 2.6m</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
</tr>
<tr>
<td>Hangar for parking &amp; maintenance (20m x 25m x 6m), the opening size min 20m x 4.5m (width x height)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>V</td>
<td>X</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>X</td>
</tr>
<tr>
<td>Apron (the size of the apron is required to be not less than 40m x 40m), there should be an auxiliary taxiway between the hangar, the apron and the runway, which can be used for the tractor to pull UAV to make a turn.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>V</td>
<td>X</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>X</td>
</tr>
<tr>
<td>Power Plant 220V/380W in the hangar (6 power distribution boxes, power 10kw, power distribution sockets above 16A)</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
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<td>V</td>
</tr>
<tr>
<td>Space for Ground Cabin 30m x 10m (The ground system is no more than 40m away from the edge of the runway) with inter-visibility to the runway</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
</tr>
<tr>
<td>Fueling (Avtur/ Gasoline 95): Min 4 Barrel for each airport</td>
<td>V</td>
<td>X</td>
<td>X</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>X</td>
<td>V</td>
<td>V</td>
</tr>
<tr>
<td>Fuel Supporting Facilities: Flame and explosion-proof devices, fire-extinguishing equipment, good ventilation, working temperature of 20±10°C, and relative humidity of 30% ~ 80%.</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
</tr>
<tr>
<td>Ground Handling (GAPURA or other GH provider) and warehouse</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
</tr>
<tr>
<td>Clearance: UAV is controlled by the wireless altimeter when the altitude is lower than 70m. Within 500m of the final-leg route and 2000m in front and at the back of the center point of the runway, there should be no tall buildings of more than 50m, complex terrain and obstacles.</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
</tr>
</tbody>
</table>
## Trial Requirements: Administration Document

<table>
<thead>
<tr>
<th>REGULATOR</th>
<th>REQUIREMENT</th>
<th>RESPONSIBILITY</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIRNAV</td>
<td>Take-off/Landing procedure</td>
<td>BEIHANG</td>
<td>In Progress</td>
</tr>
<tr>
<td></td>
<td>Surveillance UAS</td>
<td>BEIHANG</td>
<td>In Progress</td>
</tr>
<tr>
<td></td>
<td>Airspace of UAS in China (mix or separated)</td>
<td>BEIHANG</td>
<td>In Progress</td>
</tr>
<tr>
<td></td>
<td>Document trial/flight permit of UAS in China</td>
<td>BEIHANG</td>
<td>In Progress</td>
</tr>
<tr>
<td></td>
<td>Radio communication procedure between ground control and ATC</td>
<td>BEIHANG</td>
<td>In Progress</td>
</tr>
<tr>
<td>DAAO</td>
<td>UAS Registration Document for Trial (China Registration)</td>
<td>BEIHANG</td>
<td>In Progress</td>
</tr>
<tr>
<td></td>
<td>Security Clearance (SC) to Indonesian Military (Eng. Min lvl 4)</td>
<td>BEIHANG</td>
<td>In Progress</td>
</tr>
<tr>
<td></td>
<td>UAS License, Manufacturer Certification, Ops. Spec Document for UAS (Trial and Commercial)</td>
<td>BEIHANG</td>
<td>In Progress</td>
</tr>
<tr>
<td></td>
<td>Transponder Equipment</td>
<td>BEIHANG</td>
<td>In Progress</td>
</tr>
<tr>
<td>DGCA</td>
<td>Letter to Ministry of Transportation for Trial Permit and Legal</td>
<td>GARUDA</td>
<td>Done</td>
</tr>
<tr>
<td></td>
<td>Proposal for Trial Operation</td>
<td>GARUDA &amp; BEIHANG</td>
<td>In Progress</td>
</tr>
<tr>
<td></td>
<td>Technical Feasibility Study &amp; GAP analysis</td>
<td>GARUDA</td>
<td>Done</td>
</tr>
<tr>
<td></td>
<td>Representative company (head office) document</td>
<td>GARUDA &amp; BEIHANG</td>
<td>In Progress</td>
</tr>
</tbody>
</table>
# Points of Discussion from DIRNAVPEN Meeting (9 July 2019)

<table>
<thead>
<tr>
<th>Stakeholders</th>
<th>Important Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. LPPNPI (AirNav)</td>
<td>Perum LPPNPI akan melaksanakan safety assessment sebelum pelaksanaan uji coba operasional drone di bandara yang ditentukan</td>
</tr>
</tbody>
</table>
| 2. DKPPU | • 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 | • 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

Garuda Indonesia
The Airline of Indonesia
ATC: Short Range

Airline distance < 400km
Using LOS data link relay to control
ATC: Long Range

Airline distance 400km~750km, Using satcom data link to control.
ATC: Mountain

Climbing to 6000m for 300km,
Airline Distance 450km~700km
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;
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
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

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.*
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