



Quintus Advanced Products  
Co., Ltd.



Quintus AGL Maintenance

# AIRFIELD LIGHTING SERVICE



## About us

Quintus is incorporated in 1986 and has over 30 years experience in the aviation industry. We are the market leader in the field of supply and installation of Airfield Ground Lighting. Working as a sole agent of ADB SAFEGATE (Belgium), enables Quintus to offer services from the supply and installation of airfield system to project management of total turnkey system installation package.

## Service

Quintus AGL Maintenance Service is equipped to support maintenance for complete airfield lighting systems and their peripheral components of any scale. Our profound knowledge of every detail in AGL systems and our versatile experience built up during numerous installations, servicing and maintenance activities help us to deliver high quality maintenance support to even the largest projects. Our team of

experienced maintenance managers builds a maintenance organization efficient planning, execution and reporting in full compliance with regulations. Quintus AGL Maintenance Service provide expert maintenance of Airfield Ground Lighting (AGL) System, 24 hour emergency electrical system and Replacement of all airfield lighting components as needed, as requested, and/or emergency basis. Services include: **Aerodrome Beacon, Wind Cone Assembly, Obstruction Lights, Underground Electrical Cables, Constant Current Regulators (CCR), Isolation Transformer, Runway End Identification Lights (REILS), Threshold Lights, Runway and Taxiway Centreline Lights,**



# Airfield Ground Lighting - Over 30 years of experiences



## Facts & Figures

- Sole Agent of ADB SAFEGATE (Belgium) for Thailand
- Over 30 years of experience in providing complete AGL solutions include designing, supply, installation, maintenance, training and consultancy
- Over 32 airports in Thailand use our products, representing more than 70% of market shares



- First and training ce
- Design a for Asia p

## Partner in Thailand

- Airport of Thailand PLC. 6 Airports
- Department of Civil Aviation: 26 Airports
- Bangkok Airways: 3 Airports
- Royal Thai Airforce (Classified)



## International Project

Quintus has intensive experiences in working abroad with many projects realized in several countries. We are cooperating with leading companies in the region to provide the best practices of Air-

- Sri Lanka
- Laos
- Brunei
- Nepal
- Mongolia
- Papua New Guinea
- Afghanistan
- Myanmar

## Training Services

Trainings are key to our success. We regularly provide internal training and testing for our staffs. Topic of training includes all aspect of Airfield Ground Lighting system from Design



## Maintenance Services

Quintus provide Maintenance Services for airfield ground lighting system, electrical system and communication system. Currently we have 3 maintenance contracts for AGL at •Don Muang International Airport •Chiangrai International

# UTM ICAO, Unmanned Aircraft, CNS/UTM

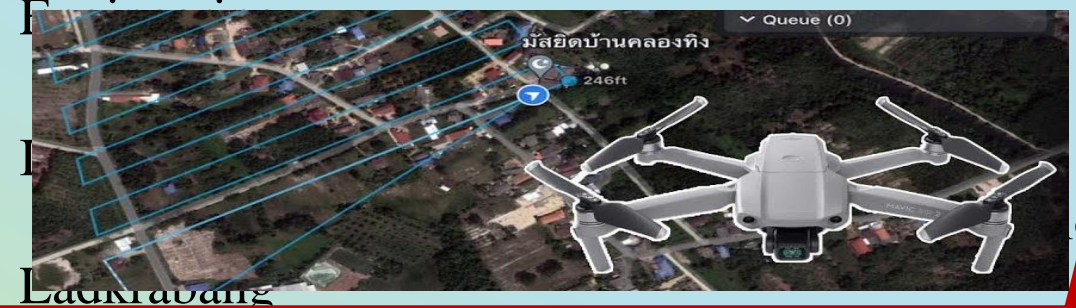
This project is about the development of air traffic management in the operation of Unmanned Aircraft (UA). This is an essential infrastructure to support the utilization of Unmanned Aircraft commercially in accordance with the state safety and security. It is a matter of urgency that a prototype infrastructure is introduced to cover air communication, navigation, surveillance as well as air Défense and near misses. Monitoring and segregation of UA from the regular air traffic control should be



**Project name :** The Development of Technology for Unmanned Aircraft in Compliance with Safety and Security Measures of the State.

**Chief's name Project :** Dr. Siriporn Yenpiem.

**Position :** Head of Aviation Innovation and Service Center and College Lecturer international aviation industry Department of Aeronautical



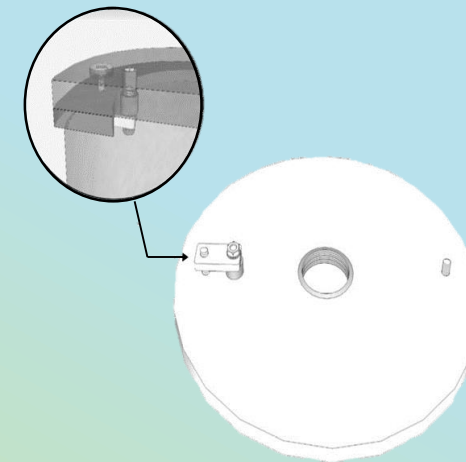
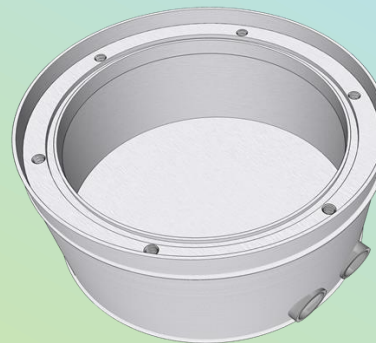
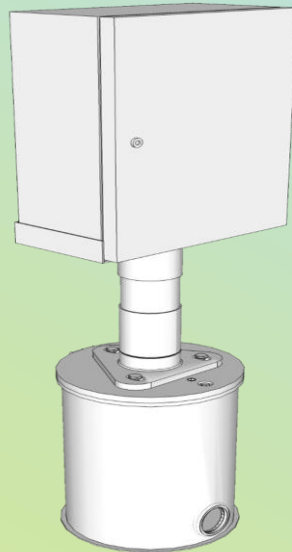
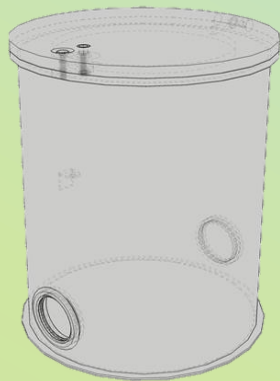
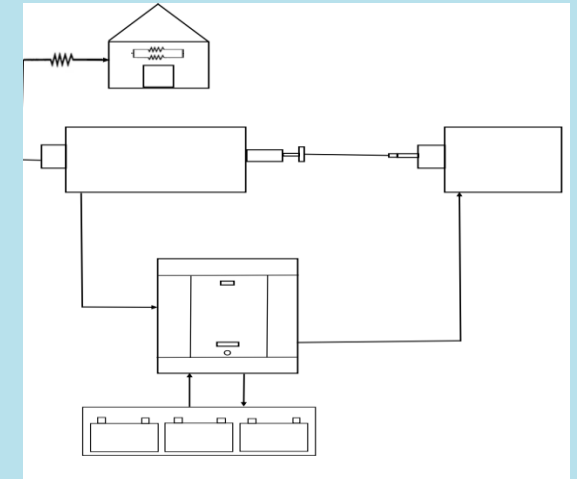
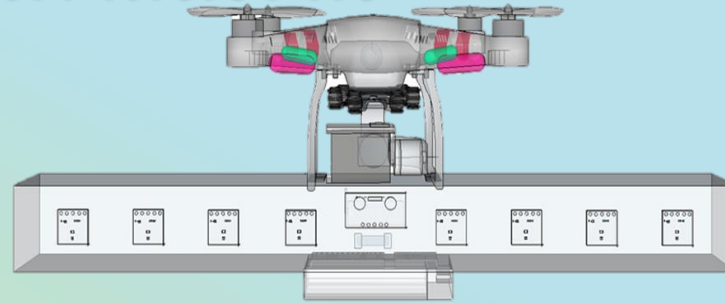
# Nam Pong Airbase



# Company's patent registration



นการดำเนินการกับกรมทรัพย์สินทางปัญญาแต่ก็ได้รับสิทธิใน  
ระหว่างการดำเนินงาน





**A. Existing Design of L-867 Light Base and Cover Plate**

**B. New Design of L-867 Light Base and Cover Plate**

**Installation of New Design L-867 Light Base and Cover Plate**

**A. Existing Design of Flange Ring**

**B. New Design of Flange Ring**

**New Flange Ring Mounted on Light Base Through Welding**

**Steel Cabinet (Non-Frangible)**

**Steel Pole (Non-Frangible)**

**Note: Existing design did not satisfy the frangibility standards of ICAO: Aerodrome Design Manual (Part 6: Frangibility) and FAA.**

**New Design**

**Practical Installation of New Design on Airport**

**Note: New design satisfied the frangibility standards of ICAO: Aerodrome Design Manual (Part 6: Frangibility) and FAA: Frangible Connections, AC No: 150/5220-23A (Draft).**

**A. Existing Design of Base Plate**

**Note: Existing design specifications according to the old edition of FAA AC 150/5345-42H**

**B. New Design of L-894 Base Plate**

**Typical Configuration of New Design L-894 Base Plate.**

**Note: New design specifications according to the Current edition of FAA AC 150/5345-42J and addition of security Camlock and 2-bolt holes**

# L – 894 Base Plate



เลขที่สิทธิบัตร 93523

สิทธิบัตรการออกแบบผลิตภัณฑ์

อาศัยอำนาจตามความในพระราชบัญญัติสิทธิบัตร พ.ศ. 2522  
อธิบดีกรมทรัพย์สินทางปัญญาออกสิทธิบัตรฉบับนี้ให้แก่

บริษัท ควินตัส แควนซ์ โปรดักส์ จำกัด

สำหรับการออกแบบผลิตภัณฑ์ตามข้อสิทธิบัตร และภาพแสดงแบบผลิตภัณฑ์ ดังที่ปรากฏในสิทธิบัตรนี้

เลขที่คำขอ 2002000491

วันขอรับสิทธิบัตร 12 กุมภาพันธ์ 2563

ผู้ออกแบบผลิตภัณฑ์ นายฐิติพันธ์ ปาจิตรานนท์

ชื่อที่แสดงถึงการออกแบบผลิตภัณฑ์ ชิ้นส่วนโคมไฟ

93523

ให้ผู้ทรงสิทธิบัตรนี้มิใช่และจะมิได้ตามกฎหมายว่าด้วยสิทธิบัตรประการ

ออกให้ ณ วันที่ 10 เดือน พฤษภาคม พ.ศ. 2566

หมดอายุ ณ วันที่ 11 เดือน กุมภาพันธ์ พ.ศ. 2573

นายฐิติพันธ์ ปาจิตรานนท์

รองอธิบดีกรมทรัพย์สินทางปัญญา ปฏิบัติราชการแทนอธิบดีกรมทรัพย์สินทางปัญญา

ผู้ออกสิทธิบัตร

002715

QR Code

## Compliance with Standards

FAA: L-894 AC 150/5345-42J (Current Edition)

## Uses

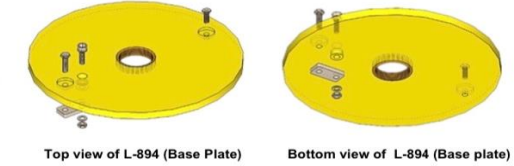
A baseplate is a cover plate that is used to mount elevated aeronautical ground lighting (AGL) equipment to the Type L-867 light base. Some product applications are:

- Runway elevated lights
- Taxiway elevated lights
- Runway Guard light

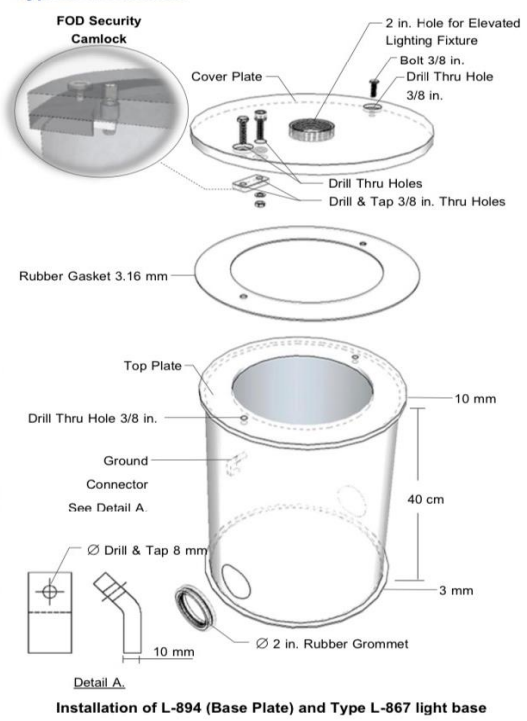
## Features

- The L-894 elevated light cover have a diameter and bolt-hole circle that corresponds to the hole of L-867 light base, size B.
- The elevated light cover has been designed only two bolt-holes circle with the Security Camlock.
- Easy to perform maintenance task such as installation and removal of the elevated light and time efficient .
- Durable aviation yellow colour powder coat.
- The cover plate of the light fixture fabricated of metal and flat as per para. 3.1.3.5.2 and para. 3.2.3.1
- The cover plate accepts all elevated light and L-804 Runway Guard Light and breakable couplings of 2-inch diameter with female 2",11 TPI thread.
- A rubber flat gasket has been provided with the cover plate to form a watertight seal between the cover plater and the L-867 light base. The gasket has a nominal thickness of 1/8-inch (3.16mm) and fit with bolt-hole circle of the L-867 light base flange.
- When the elevated light cover is bolted on to an L-867 light base, it can withstand an evenly distributed static compressive load of 2,500 pounds (1,134 kg) and a bending moment of 2,500 foot-pounds (3,390Nm) for the L-804 and 700 foot-pounds (949 Nm) for all other applications without damage or permanent deformation, as per para. 3.2.3.1.4.
- Excess wind speeds of 482 km/h (300 mph).
- All stainless-steel hardware.

## L-894 (Base Plate)



## Typical Installation



A. Existing Design of Base Plate

Thread Depth Limit of 0.88 in. (22.35mm)

Slope Shape Base Plate

6-Bolt Holes

Note: Existing design specifications according to the old edition of FAA AC 150/5345-42H

B. New Design of L-894 Base Plate

Flat Shape L-894 Base Plate

Top View

Bottom View

2-Bolt Holes

Security Camlock

Thread Depth for Elevated Light Fixture

Typical Configuration of New Design L-894 Base Plate.

Top View

Bottom View

Elevated light mounted on L-894 base plate

Note: New design specifications according to the Current edition of FAA AC 150/5345-42J and addition of security Camlock and 2-bolt holes



# Flang Ring



93522

### Compliance with Standards

**FAA: AC 150/5345-42J (Current Edition)**

### Uses

L-868 shallow base are receptacles for inset lights for site requirements at airports. The bases are 8" and 12" in size and compatible with any inset light.

The L-868 shallow base has following application areas.

- Ground fixing of 8" inset light fittings (Base 8")
- Ground fixing of 12" inset light fittings (Base 12")
- Ground fixing of 8" inset light fittings with adapter ring (Base 12")

### Features & Benefits

- Low resin consumption
- Robust mechanical design
- Flexible installation possibilities
- Anti-rotation pins (Base 8" only)
- Common accessories for Base 8"/12"

### Design

1. Base 8" and Base 12" families are built on similar casting designs
2. Flange ring completely constructed through machining and flange ring welded on L-868 light base
3. Optional cable side entry
4. Insert thread (M10 or UNC 3/8")
5. Anti-rotation pins (Base 8" versions only)



L-868 Light Base Flange Ring Welded on Light



### Installation

Base receptacle defines uniquely the location, orientation and level of the inset light fitting assembled on it. The base receptacles are attached to ground by gluing to the asphalt or concrete. Once glued, the base receptacles are permanently fixed to their position and reorienting or re-leveling is no longer possible. It is therefore important to install a base receptacle carefully using the specific base alignment tools developed for this purpose.

### Technical Characteristics

Characteristics	Description
Dimensions	Base 8" – 135mm depth Base 12" – 150mm depth
Weight:	2.6 kg, Base 8" 5.7 kg, Base 12"
Materials:	High pressure die cast aluminum
Ingression protection	Water protected design according to AC 150/5345-42J, §4.3.5
Cable access	Side entry base versions optionally equipped with one or two open side entries for cable access. Designed for PG16 threaded cable glands

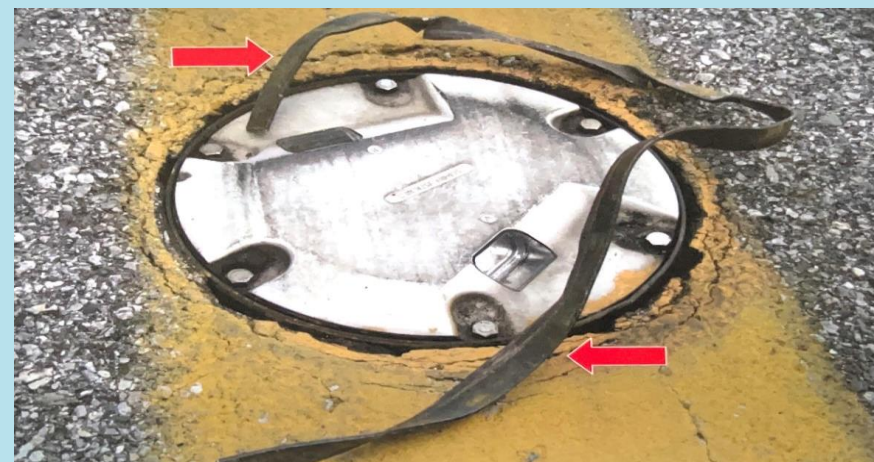
### A. Existing Design of Flange Ring



### B. New Design of Flange Ring



# Problems at the



# Frangible Mounting Support



## FRANGIBLE MOUNTING SUPPORT OF RUNWAY THRESHOLD IDENTIFICATION LIGHT (RTIL) SEQUENCE FLASHING LIGHT (SFL) POWER CONNECTION NET

Existing Design  
command option



Note: Existing design did not satisfy the frangibility standards of ICAO: Aerodrome Design Manual (Part 6: Frangibility) and FAA.



Note: New design satisfied the frangibility standards of ICAO: Aerodrome Design Manual (Part 6: Frangibility) and FAA: Frangible Connections, AC No: 150/5220-23A (Draft).

### Compliance with Standards

ICAO: Aerodrome Design Manual Part 6, Frangibility  
FAA: AC No: 150/5220-23

### Uses

Basically, Aviation Ground Lighting flashing lights are landing aids for poor weather conditions. They are switched on when the effective range of steady burning approach lights at full intensity becomes insufficient to ensure adequate guidance. Since it may also be desirable to operate such systems under good visibility conditions, for instance to facilitate the location of the runway in urban areas, the use of a 3-level system avoids dazzling. Flashing lights may be used as:

- Sequenced flashing lights (SFL) in (non-) precision approaches,
- Runway threshold identification light systems (RTILS),
- The combination of the above SFL and RTIL systems
- To add a runway alignment segment to a medium-intensity approach lighting (system MALSRL),
- Lead-in (LDIN) approach lights (on request).

### General Description

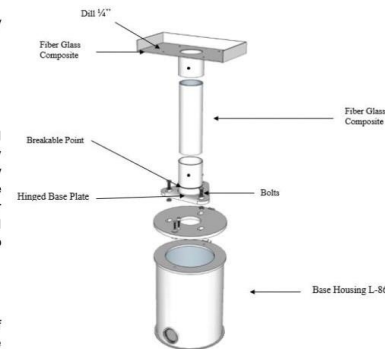
The fixtures are available as elevated and inset unidirectional applications. All Flasher Control Units are electrically identical. Typically, sequential flashing light powered by equipment cabinet. The cabinet are mounted on a frangible support, offering the advantage of a most easy access for installation or servicing even as a complete mechanical protection of the in- and outgoing cables as compare to traditional steel pipe mounting support.

### Features

- Mounting support of power equipment cabinet of sequential flashing light designed by using a composite material also known as fiber-reinforced plastics (FRP).
- Due to frangible design mounting support and breakable coupling allowed us to install the cabinet near SFL flasher head. There is a less power loss in the cable between the equipment and the flasher head also increases the efficiency of system due to less distance between the flasher head and power equipment cabinet.
- FRP based mounting support have superior strength to weight ratio compared to steel and aluminum.
- Mounting support split into three parts. Split parts coupled through friction joints which is a frangible connection.

- Advantage of using a friction joint design mounting support can be simple, easy to install and low maintenance.
- Mounting support attached on a hinged base plate and connection between a mounting support and hinged base plate is breakable.
- Any type of SFL cabinet can be mounted on the top part of frangible support with the help of bolts.
- The mounting support with cabinet coupled on the base housing L-867 with the help of bolts.
- Mounting support frangible, light weight, good chemical and corrosion resistance, does not conduct heat and cold and low maintenance.
- Length of mounting support depends on installation location

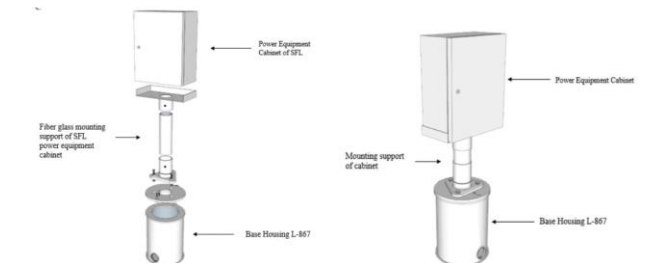
### Frangible Mounting Support of SFL



### Mounting Support of SFL Power Equipment Cabinet



Mounting Support with SFL Power Equipment Cabinet Installed at Thailand Airports



# - 867 Light Base & Cover Plate



**A. Existing Design of L-867 Light Base and Cover Plate**

**B. New Design of L-867 Light Base and Cover Plate**

**Installation of New Design L-867 Light Base and Cover Plate**

## Compliance with Standards

**FAA:** AC 150/5345-42J (Current Edition)

## Uses

Applications subject to occasional light vehicular loads but no aircraft or other heavy vehicular loads. The base typically supports an elevated taxiway light fixture and houses a powering isolation transformer. It can also be used solely as a junction box or transformer housing. Some product applications are:

- Elevated Lights
- Nav aids such as Precision Approach Path Indicators (PAPI), Runway End Identifier Lights (REIL), and ALSF/MALSR Approach Systems
- Signs
- Junction/Splice Box

## Non-Load Bearing Standard FAA L-867 Sizes:

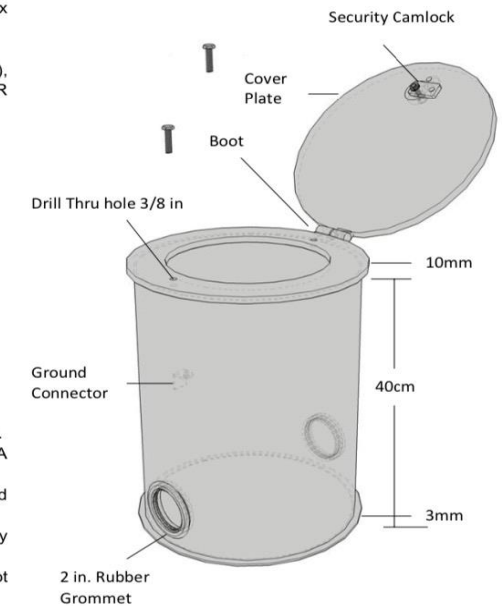
- B=12" diameter
- D=16" diameter
- E=24" diameter
- 

**Standard Height: 24"**

## L-867 Light Base

- One- and two-piece configurations.
- Extensions and spacers available.
- All bases provided with an internal and external ground strap.
- Each base (standard) had a one copper ground lug kit. A second ground lug kit can be provided as an option.
- Standard bases provided as Class IA, hot dipped galvanized steel standard. Also available in adjustable steel.
- Optional Class IB available in stainless steel or internal epoxy coating.
- Cover plate mounted on L-867 light base through boot connection.
- Cover plate provided with Security Camlock and two bolt-holes.
- Tapped holes in top flange rings are located on centerline of couplings. Tolerance:  $\pm 0.1875$  inch (0.47 cm).
- Standard lengths for the 12-inch (30.48 cm) diameter light base are 20 inches (50.8 cm) and 24 inches (60.96 cm) with a tolerance of  $\pm 0.25$  inch. Standard lengths for the 16-inch (40.64 cm) diameter light base are 20 inches (50.80 cm)

and 24 inches (60.96 cm) with a tolerance of  $\pm 0.25$  inch. Standard lengths for the 24-inch (60.96 cm) diameter light base are 20 inches (50.80 cm) and 24 inches (60.96 cm) with a tolerance of  $\pm 0.25$  inch.

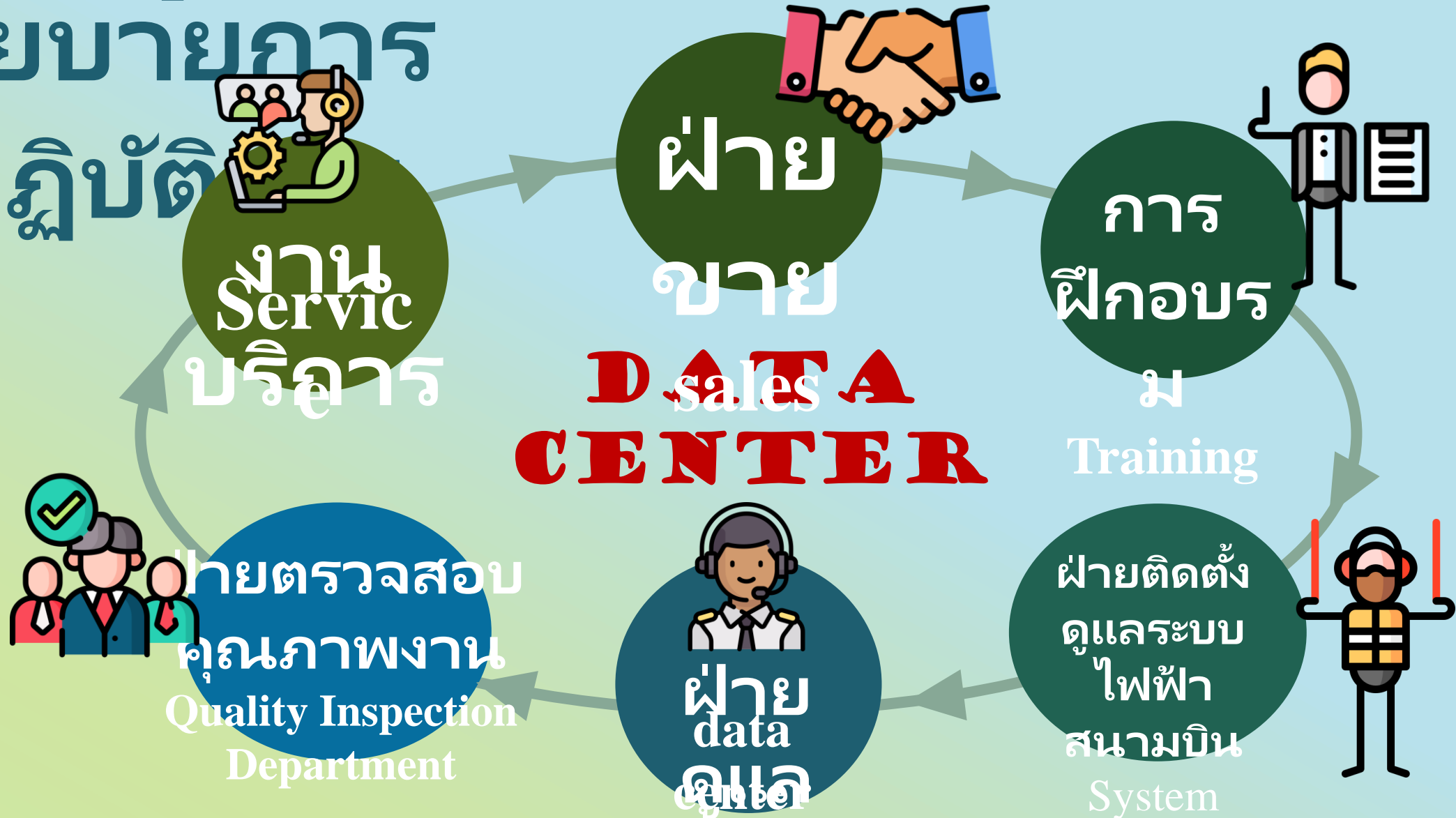


**L-867 Size B Light Base**

# Policy implementation

## นโยบายการ

## ปฏิบัติ



# Toward Future Digital Aviation Industry

## Airport 4.0 – ATM / UTM

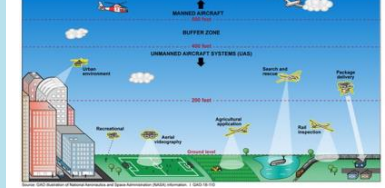
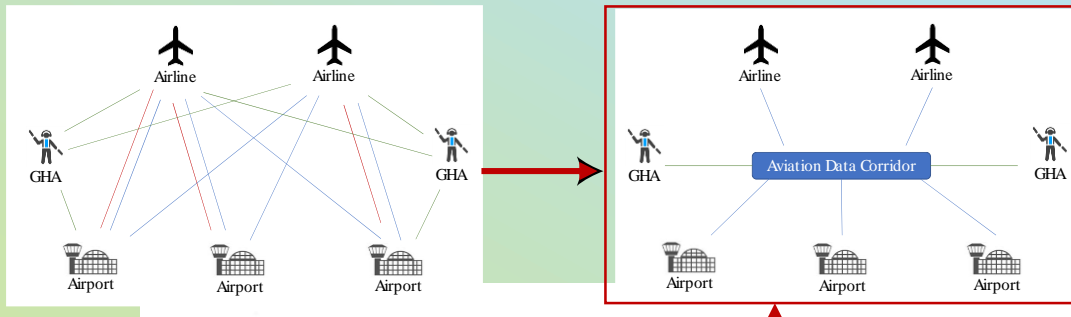


Figure 3. Air space guidance for small UAS operators (FAA n.d.).

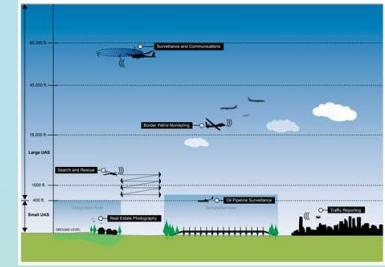


Figure 10. Future NAS UAS operations (FAA, The Future of the NAS, 2016).

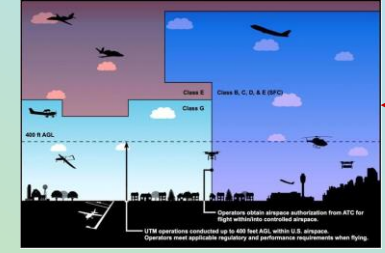
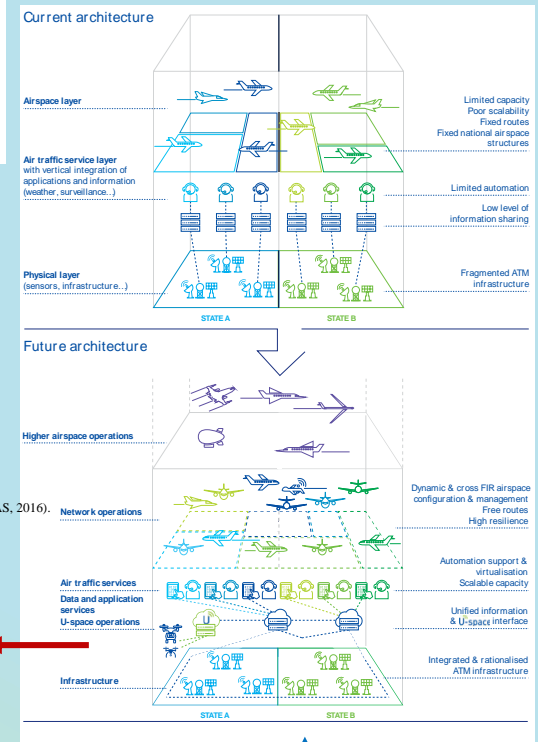


Figure 12. UTM operations in context of airspace classes (FAA, 2020).



### Revolutionizing Airport Operations

Digital 'Twin'

Gateway

AVIC Maintenance

Airfield Lighting Control and Monitoring System

Local Network

Cloud

Private VPN Link

Digital 'Twin'

Constant Current Regulator

Type: MS-CRE

Size: 20kW

Input: 240VAC

Output: 6.6A

28R Rwy Edge

Circuit: 112

**AIRFIELD 4.0**

Physical Cyber

Physical Devices

CCR CCR CCR CCR

PERFORMANCE

- Input Voltage: 235 VAC
- Brightness Step: 3 of 5
- Output: 4.15 Amps
- Load: 17,457 VA
- Insulation Resistance: 5 M Ohm
- Lights Out: 3

ALARM SETTINGS

- Input Voltage: 5%
- Incorrect Current: 5%
- Load: 10%
- Insulation Resistance: Warning: 50M Alarm: 10M
- Lights Out: Warning: 5% Alarm: 10%

**ALIS Dashboard**

ADD SAFEGATE

The world of aviation is changing. Aircraft are becoming more autonomous, more connected, more intelligent, and more diverse. Air passengers increasingly expect eco-friendly, smart and personalized mobility options that allow them to travel seamlessly and efficiently. They want quick and reliable data to inform their travel choices, not only on schedules, prices and real-time punctuality, but increasingly also on environmental impacts. To deliver this new era in aviation, leveraging technology is key.

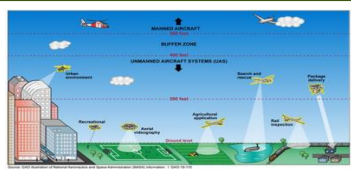


Figure 3. Air space guidance for small UAS operators (FAA n.d.).

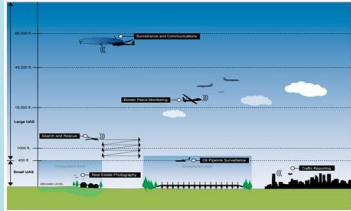


Figure 10. Future NAS UAS operations (FAA, The Future of the NAS, 2016).

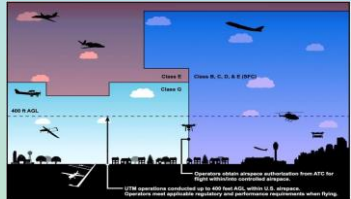
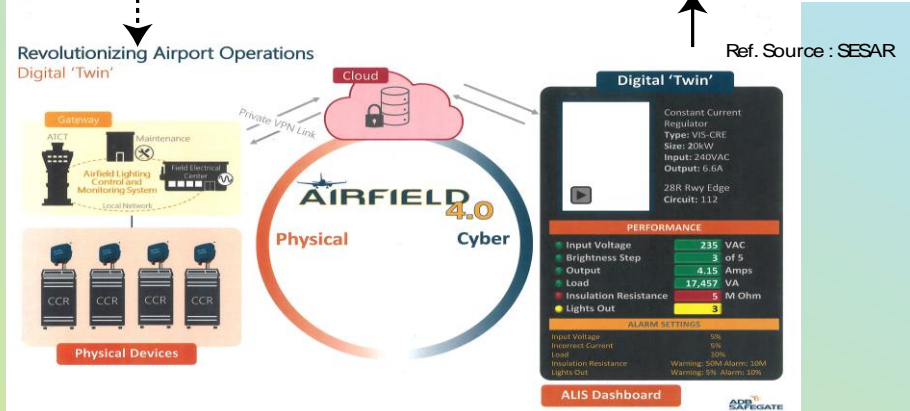
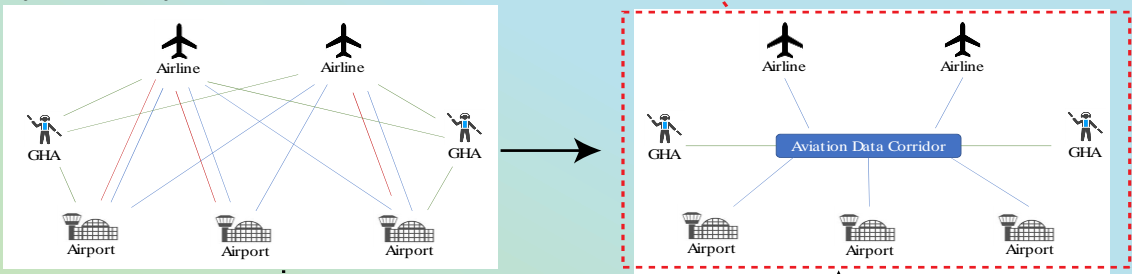
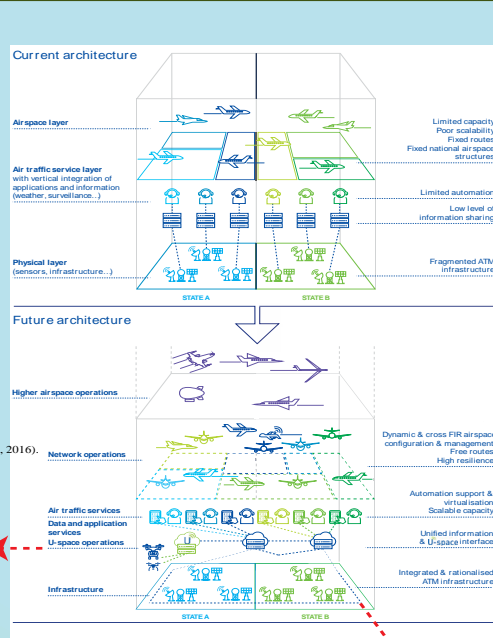


Figure 12. UTM operations in context of airspace classes (FAA, 2020e).



# ICAO Annex 14



## ICAO Doc 8126 and PANS-AIM Doc 10066

**As the global AIM community moves away from a product-centric and paper-based environment through the provision and exchange of quality - assured digital aeronautical data in collaboration with all parties.**

## ICAO Annex 14

### Chapter 2: Aerodrome Data

**2.1.4-Digital data error detection techniques shall be used during the transmission and/or storage of aeronautical data and digital data sets.**

# ICAO Annex 14



## Aerodrome dimensions and related information

2.5.1 The following data shall be measured or described, as appropriate, for each facility provided on an aerodrome:

g) visual aids for approach procedures, marking and lighting of runways, taxiways and aprons, other visual guidance and control aids on taxiways and aprons, including taxi- holding positions and stopbars, and location and type of visual docking guidance systems;

## Condition of the movement area and related facilities

2.9.1 Information on the condition of the movement area and the operational status of related facilities shall be provided to the appropriate aeronautical information service units, and similar information of operational significance to the air traffic services units, to enable those units to provide the necessary information to arriving and departing aircraft. The information shall be kept up to date and changes in conditions reported without delay.

2.9.2 The condition of the movement area and the operational status of related facilities shall be monitored and reports on matters of operational significance or affecting aircraft performance given, particularly in respect of the following:

h) failure or irregular operation of part or all of the aerodrome visual aids

# ICAO Annex 14



## **2.13 Coordination between aeronautical information services and aerodrome authorities**

2.13.1 To ensure that aeronautical information services units obtain information to enable them to provide up-to-date pre-flight information and to meet the need for in-flight information, arrangements shall be made between aeronautical information services and aerodrome authorities responsible for aerodrome services to report to the responsible aeronautical information services unit, with a minimum of delay:

b) the operational status of associated facilities, services and navigation aids within their area of responsibility

2.13.2 Before introducing changes to the air navigation system, due account shall be taken by the services responsible for such changes of the time needed by the aeronautical information service for the preparation, production and issue of relevant material for promulgation. To ensure timely provision of the information to the aeronautical information service, close coordination between those services concerned is therefore required.

2.13.4 The aerodrome services responsible for the provision of raw aeronautical information/data to the aeronautical information services shall do that while taking into account accuracy and integrity requirements for aeronautical data as specified in Appendix 5 to this Annex.

# ICAO Annex 14



## CHAPTER 8. ELECTRICAL SYSTEMS

### **8.3 Monitoring**

**8.3.1 Recommendation.**— *A system of monitoring should be employed to indicate the operational status of the*

**8.3.2** Where lighting systems are used for aircraft control purposes, such systems shall be monitored automatically so as to provide an indication of any fault which may affect the control functions. This information shall be automatically relayed to the air traffic service unit.

**8.3.3 Recommendation.**— *Where a change in the operational status of lights has occurred, an indication should be provided within two seconds for a stop bar at a runway-holding position and within five seconds for all other types of visual aids.*

**8.3.4 Recommendation.**— *For a runway meant for use in runway visual range conditions less than a value of 550 m, the lighting systems detailed in Table 8-1 should be monitored automatically so as to provide an indication when the serviceability level of any element falls below the minimum serviceability level specified in 10.4.7 to 10.4.11, as appropriate. This information should be automatically relayed to the maintenance crew.*

**8.3.5 Recommendation.**— *For a runway meant for use in runway visual range conditions less than a value of 550 m, the lighting systems detailed in Table 8-1 should be monitored automatically to provide an indication when the serviceability level of any element falls below the minimum level specified by the appropriate authority below which operations should not continue. This information should be automatically relayed to the air traffic services unit and displayed in a prominent position*



## CHAPTER 10. AERODROME MAINTENANCE

### Visual Aids

10.5.1-A light shall be deemed to be unserviceable when the main beam average intensity is less than 50 percent of the value specified in the appropriate figure in Appendix 2. For light units where the designed main beam average intensity is above the value shown. in Appendix 2, the 50 per cent value shall be related to that design value.

10.5.5-Measurement of intensity, beam spread and orientation of lights included in approach and runway lighting systems for a precision approach runway category II or III should be undertaken using a mobile measuring unit of sufficient accuracy to analyze the characteristics of the individual lights.

10.5.6-The frequency of measurement of lights for a precision approach runway category II or III should be based on traffic density, the local pollution level, the reliability of the installed lighting equipment and the continuous assessment of the results of the in-field. measurements but, in any event,



## **Annex 15: Aeronautical Information Services**

### **Use of Automation**

3.5.1-Automation shall be applied in order to ensure the timeliness, quality, efficiency and cost-effectiveness of aeronautical information services.

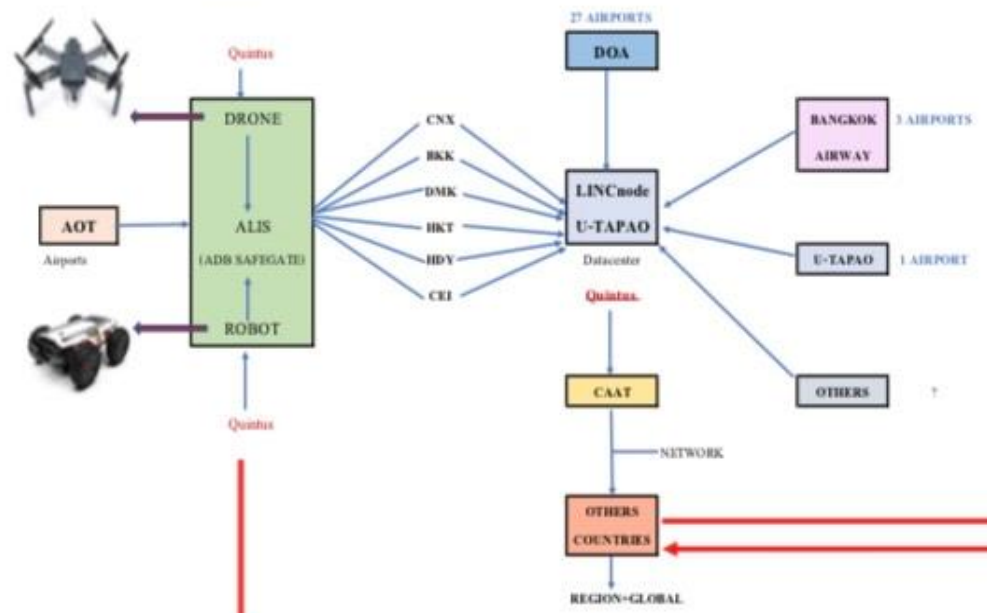
3.5.2-In order to meet the data quality requirements, automation shall:

- a) enable digital aeronautical data exchange between the parties involved in the data processing chain; and
- b) use aeronautical information exchange models and data exchange models designed to be globally interoperable



# Smart Digital Airport Toward Future Airport 4.0

## Phase 1



## Phase 2

Prediction  
 A-ODB : Airport Operation Database  
 A-CDM : Airport Collaborative Decision Making  
 RMS : Remote Monitoring System  
 FIDS : Flight Information Display System  
 REVENUE: Commercial Viability of all activities



## Phase 3



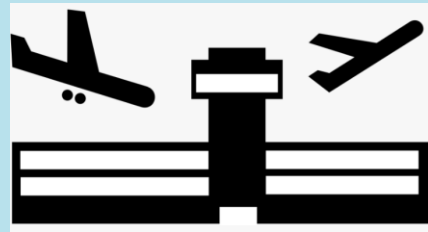
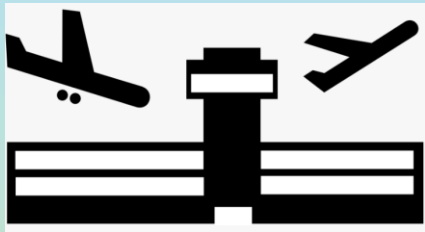
Swim meets Blockchain-base Technology

AIM – Aeronautical Information Management  
 ATM – Air Traffic Management  
 MET – Operational Meteorological Information  
 MHS – Aeronautical Message Handling System

## Revolutionizing Airport Operations Digital 'Twin'



# IT Infrastructure

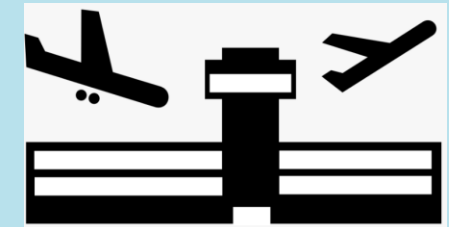
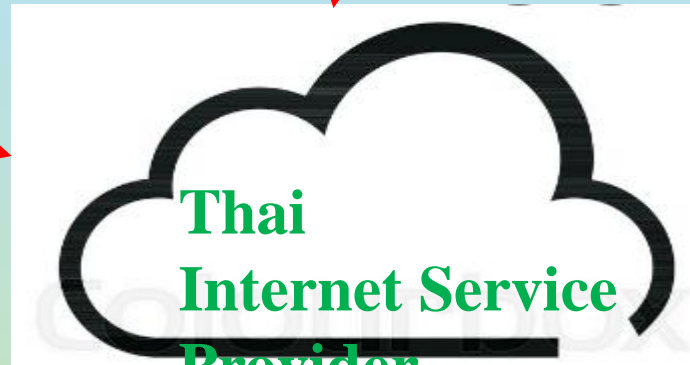


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Airport 1, Thailand Airport 2, Thailand



ALCS



Airport N, Thailand



ALCS

Data Center in Utapao, Thailand





AERODROMES AND GROUND AIDS TRAINING CENTER  
ศูนย์ฝึกอบรมระบบไฟฟ้าสนามบิน

# Test center

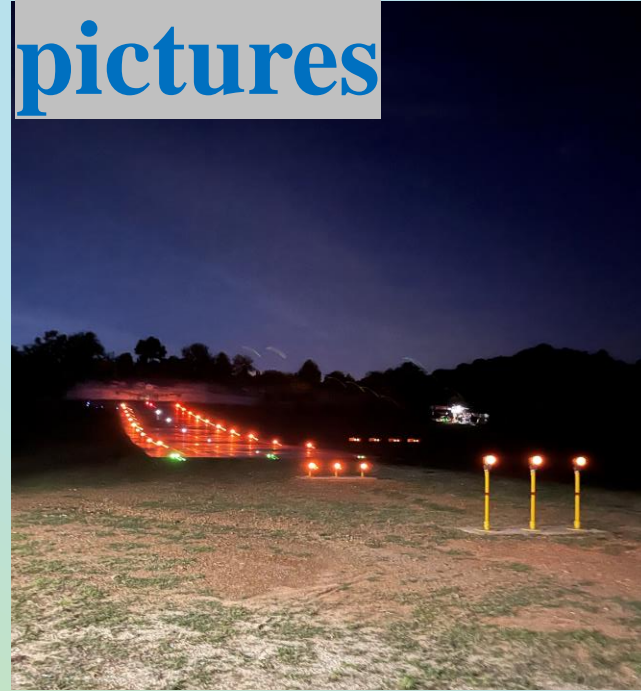


# Test center pictures



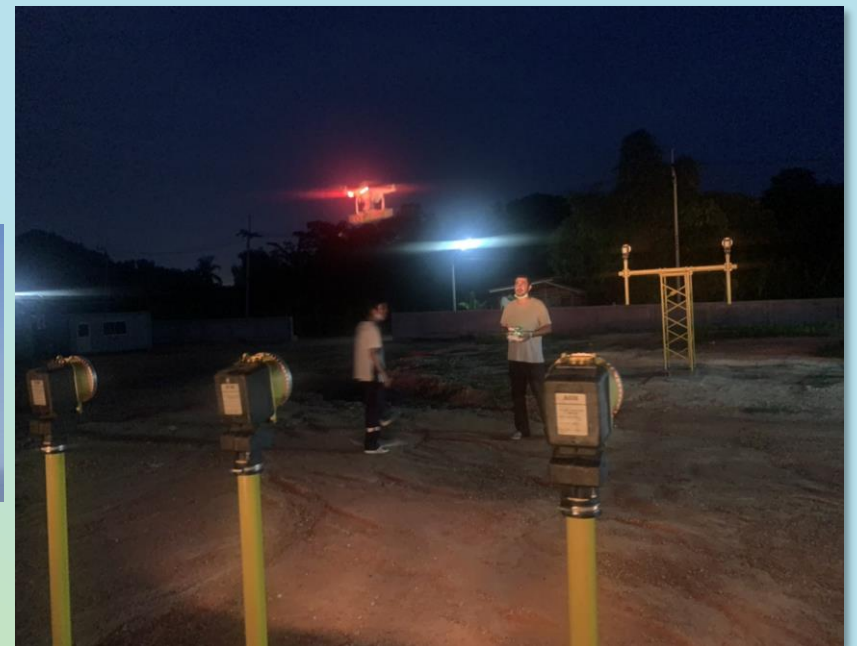


# Test center pictures





## Test center





<https://airfielddatacenter.com>

*Moving Towards Future Digital Transformation*

**Quintus AGL Maintenance Service Co.,**

 **Ltd.**



**333/3 Mu 5 Plutaluang Sattahip Chonburi**



**280 ( Thailand )**

**[dhitinant@gmail.com](mailto:dhitinant@gmail.com)**

**+66 81 8130 377**