CASE STUDIES

WORLD'S SAFEST RUNWAY LIGHTING
CASE STUDY
ETHIOPIA
JIJIGA AIRPORT

PROJECT KEY FACTS

Airport: Jijiga Airport
Location: Ethiopia, Somali Region
Application: International airport
Runway: 2,400 m x 45 m
Solution: Complete Solar LED Airfield Lighting System
Buyer: Ethiopian Airlines
Year of Installation: 2018

OVERVIEW

Jijiga Airport (Wilwal International Airport) is serving Jijiga - capital city of Somali Region in Ethiopia. By the 1990s, the airport was used by Ethiopian Air Force and until now the runway has not been illuminated with any airfield lights.

In recent years, the Ethiopian Government has been heavily investing in airports reconstruction including rehabilitation of a runway at Jijiga Airport.

CHALLENGE

For most African airports – and Jijiga is not an exception - it's always been a challenge to install systems that require stable power supply - would it be terminal, tower or airfield:

• Electrical power supply is unstable due to unreliable electrical grid
• Installation of a traditional hard-wired electrical system (including AGL) is economically inefficient due to limited budget
• The cost of electricity in Africa is one of the highest in the World.

As a result, A Tender for The Supply, Installation, and Commissioning of Solar Airfield Lighting System at Jijiga Wilwal Garad Airport has been issued.

SOLUTION

S4GA together with its partner Alpha Airport provided complete Solar LED airfield lighting system which:

• operates 365 days on solar energy
• has 5-level protection against system failure
• designed for non-precision airports located in countries with high photovoltaic potential and unreliable electrical supply
CASE STUDY
ETHIOPIA
JIJIGA AIRPORT

S4GA PRODUCTS

SOLAR RUNWAY EDGE LIGHT
SOLAR THRESHOLD LIGHT
SOLAR RUNWAY END LIGHT
SOLAR TAXIWAY LIGHT

SOLAR APPROACH LIGHT
UR-201 CONTROL & MONITORING UNIT
ALCMS ADVANCED

APPLICATION PHOTOS
CASE STUDY
MALDIVES
DHAALU AIRPORT

PROJECT KEY FACTS

- **Airport:** Dhaalu Airport
- **Location:** Kudahuvadhoo Island, Maldives
- **Application:** Regional airport located on remote island
- **Runway:** 1.800 m x 30 m
- **Solution:** Complete Solar LED Airfield Lighting System
- **Products:** Solar Runway Lights, Solar Threshold End Lights, Solar Taxiway Lights, Solar PAPI, Solar engine for PAPI, UR-201 Control & Monitoring Unit, ALCMS Basic Control & Monitoring System
- **Year of Installation:** 2016

OVERVIEW

Dhaalu Airport is a category 3C domestic airport located in Kudahuvadhoo Island. Airport is designed to accommodate DASH-8, ATR – 72 & 42 Aircraft and private jets.

The airport was developed by reclaiming land from the Dhaalu Kudahuvadhoo lagoon and according to local news sources, approximately USD 20 million were invested in the project.

CHALLENGE

Airport managing company has been working toward design of conventional lighting system with one of Maldivian engineering companies. After design phase has been accomplished it turned out that valuation of the system significantly exceeded airport budget planned for AGL. In order to find more affordable solution airport started looking for alternatives.

SOLUTION

S4GA company responded with an offer to supply a complete solar LED airfield lighting system to Dhaalu Airport. As a result

- Budget required for S4GA solar AGL system was lower than for conventional lighting.
- Airport is located in the area where electricity can only be produced by diesel generator which is expensive and not ecofriendly. S4GA solar lighting operates 365 days on solar energy.
- S4GA solar AGL has 5-level protection against system failure which minimizes the risk of total AGL breakdown; in case of any light(s) malfunction, airport personnel is immediately notified by SMS about the problem and which lamp has a problem.

The system is compliant with ICAO Annex 14, all required certificates and technical specifications were provided accordingly. S4GA solar AGL has been approved by Maldivian Civil Aviation Authority.
CASE STUDY
MALDIVES
DHAALU AIRPORT

S4GA PRODUCTS

APPLICATION PHOTOS
CASE STUDY
NORTH AFRICA
MILITARY AIRBASE

PROJECT KEY FACTS

Airport: Military Air Base
Location: North Africa
Application: Military airport located in African desert
Runway: two runways of 3,000 m
Solution: Solar LED Airfield Lighting System
Products: Solar Runway Lights, Solar Threshold End Lights, Solar Taxiway Lights, PAPI, WDI, Taxiway Retro Reflective Markers, Guidance Signs, UR-201 Control & Monitoring Unit
Year of Installation: 2015

OVERVIEW

In 2015 S4GA has been contacted by local African construction company planning to install airfield lighting at military airbase. Customer considered conventional lighting however has very little experience in area of airfield lighting.

Scope of work was: to illuminate 3,000 m runway and parallel taxiway that was used by air forces as secondary runway.

CHALLENGE

The airport was equipped with old airfield lighting system that was partially vandalized and did not work properly. Airbase power supply was unreliable and based 100% on power generator. The solution was to install new airfield ground lighting.

However, the main issue that made almost impossible to use hard-wired runway lighting was lack of main electrical power supply as airport is located in a desert.

SOLUTION

Alternative solution for this airfield was either using diesel generator or solar airfield lighting.

S4GA offered solar LED airfield lighting system that requires neither electrical power supply nor building a complex power supply network (CCRs, transformers, cables, etc.). In North Africa where photovoltaic potential is one of the highest on the planet, S4GA solar AGL operates 365 days a year on solar energy.

Offered solar system requires minimum maintenance – End Customer is expected to exchange batteries once in 2-3 years – which is equal to less than 1% of AGL system total cost.

Installation and commissioning of a complete runway lighting has lasted less than 4 weeks. In case of traditional wired system, it would take few months at least.
CASE STUDY
NORTH AFRICA MILITARY AIRBASE

S4GA PRODUCTS

SOLAR RUNWAY EDGE LIGHT
SOLAR RUNWAY THRESHOLD END LIGHT
SOLAR TAXIWAY LIGHT
PAPI LIGHT

WIND DIRECTION INDICATOR
TAXIWAY EDGE RETRO REFLECTIVE MARKER
GUIDANCE SIGN
UR-201 CONTROL & MONITORING UNIT

APPLICATION PHOTOS
CASE STUDY
Greece
Thessaloniki Airport

PROJECT KEY FACTS

- **Airport:** Thessaloniki International Airport
- **Location:** Greece
- **Application:** The 3rd busiest international airport in Greece
- **Solution:** Solar LED Runway Lighting System
- **Products:** Solar Runway Lights, Solar Threshold End Lights, UR-201 Control & Monitoring Unit, ALCMS Basic Control & Monitoring System
- **Buyer:** Fraport
- **Year of Installation:** 2017

OVERVIEW

Thessaloniki Airport (officially Thessaloniki Airport “Makedonia”) is the third largest international airport in Greece operated by Fraport. The airport has two runways equipped with ILS navigation systems.

Few years ago Greek government launched the upgrade program for Thessaloniki and few other airports and handed it over to Fraport Greece. For Thessaloniki, the project included extension of Runway 10-28 with the additional modernization of runway 16-34.

CHALLENGE

Despite the fact that both runways have been closed for reconstruction, the airport still had to continue flight operations: there are no similar airports nearby where flight operations from Makedonia Airport could be transferred to.

Fraport started looking for temporary runway lighting with strict requirements:

- certified and compliant with ICAO regulations
- AGL system should operate nonstop 24/7
- Delivery within a month – which is extremely short period for implementation of such project

SOLUTION

S4GA offered solar LED runway lighting system which fully met Fraport’s requirements:

- S4GA solar AGL is compliant with ICAO Annex 14 and certified by Intertek
- It operates 365 days on solar energy
- S4GA ALCMS – Airfield Lighting Control and Monitoring System – allows control of solar runway lighting from Airport Tower
- the Company managed to manufacture and deliver the system within one month.
CASE STUDY
GREECE
THESSALONIKI
AIRPORT

S4GA PRODUCTS

SOLAR RUNWAY
EDGE LIGHT

SOLAR RUNWAY
THRESHOLD END
LIGHT

UR-201 CONTROL
& MONITORING
UNIT

ALCMS BASIC

APPLICATION PHOTOS

S4GA PRODUCTS

SOLAR RUNWAY
EDGE LIGHT

SOLAR RUNWAY
THRESHOLD END
LIGHT

UR-201 CONTROL
& MONITORING
UNIT

ALCMS BASIC

APPLICATION PHOTOS

S4GA PRODUCTS

SOLAR RUNWAY
EDGE LIGHT

SOLAR RUNWAY
THRESHOLD END
LIGHT

UR-201 CONTROL
& MONITORING
UNIT

ALCMS BASIC

APPLICATION PHOTOS

S4GA PRODUCTS

SOLAR RUNWAY
EDGE LIGHT

SOLAR RUNWAY
THRESHOLD END
LIGHT

UR-201 CONTROL
& MONITORING
UNIT

ALCMS BASIC

APPLICATION PHOTOS

S4GA PRODUCTS

SOLAR RUNWAY
EDGE LIGHT

SOLAR RUNWAY
THRESHOLD END
LIGHT

UR-201 CONTROL
& MONITORING
UNIT

ALCMS BASIC

APPLICATION PHOTOS
CASE STUDY
ARGENTINA MILITARY AIRBASE

PROJECT KEY FACTS

Location: Argentina
Application: Military Air Base
Solution: Portable Airfield Lighting Trailer
Products: Portable Runway Edge Lights, Portable Runway Threshold End Lights, Portable Full PAPI, Power Bank for PAPI, Diesel Generator, UR-201 Control & Monitoring Unit, UR-101 Handheld Controller, Trailer
Year of Delivery: 2019

OVERVIEW

Argentine Air Force (Spanish: Fuerza Aérea Argentina, FAA) is aviation branch of the Armed Forces of the Argentine. There are few air bases around the country that belong to FAA and are used for military trainings.

In 2018, FAA requested for mobile airfield lighting system which army was going to use at its air bases. A Tender for supply and delivery of portable airfield lighting trailer was issued. S4GA received and official invitation to bid and won the tender.

CHALLENGE

Military Customer has put special technical requirements to the trailer design and airfield lights. Any standard solution available on the market would not fit:

• High operating time (autonomy) of the lights required
• The trailer had to accommodate two full mobile PAPI systems together with airfield lights
• Contactless charging of the lights
• All equipment to be made of durable materials to withstand extreme climate conditions of Argentina and to ensure long lifespan
• Non-standard trailer dimensions.

SOLUTION

S4GA offered portable airfield lighting system stored in a tailored trailer specifically designed for Argentine Air Force:

• 86 x portable airfield lights, remotely controlled from handheld controller and air-band radio, certified and compliant with ICAO requirements
• 2 x mobile full PAPI systems powered by diesel generators
• Power banks to ensure PAPI autonomous operations for at least 60 minutes
• Automatic immediate light failure reporting system built in a Trailer
• S4GA Trailer is made of high-grade aluminum and designed to fit in a C-130, for transportation.

S4GA Trailer is the best solution for military air bases where high performance of the system and its compliance with industry standards is a must.
CASE STUDY
ARGENTINA MILITARY AIRBASE

S4GA PRODUCTS

PORTABLE RUNWAY EDGE LIGHT
PORTABLE RUNWAY THRESHOLD END LIGHT
PORTABLE PAPI LIGHT
POWER BANK FOR PAPI
UR-201 CONTROL & MONITORING UNIT
UR-101 HANDHELD CONTROLLER
DIESEL GENERATOR
TRAILER

APPLICATION PHOTOS

S4GA Military Trailer equipped with portable airfield lighting system

SP-401 Portable Airfield Lights

Carrying handle for easy drop-in and drop-out of the light

UR-101 Handheld Controller

Portable full PAPI system

www.solutions4ga.com
CASE STUDY
NORTHEAST AFRICA MILITARY AIR BASE

PROJECT KEY FACTS

Location: Northeast Africa
Application: Military Air Base
Solution: Portable Airfield Lighting Trailer
Products: Portable Runway Edge Lights, Portable Runway Threshold End Lights, UR-101 Handheld Controller, Diesel Generator, Trailer
Year of Delivery: 2019

OVERVIEW

Undisclosed military air base located in Northeast Africa. To operate at night, air base should have illuminated runway.

S4GA has been awarded delivery of Portable Airfield Lighting Trailer by one of Africa’s leading remote site service providers that serves UN agencies such as UNICEF, UNHCR; governmental organizations such as the UK MOD, the US State Department and the EU.

CHALLENGE

The were two main challenges in regards to runway lighting system requested:

• Time: air base had to start night flights as soon as possible: delivery time was critical factor.
• Non-standard application: AGL system should be easily transportable to other locations. In the meantime, airfield lighting will be used as semi-permanent application, therefore constant power supply is a must.

SOLUTION

S4GA offered complete portable runway lighting system stored in a Trailer and fully compliant with international aviation regulations.

The AGL system is activated remotely via Handheld Controller. Light brightness, operating modes and light grouping are selectable via the Controller.

Stored in heavy duty Trailer, airfield lights can be safely transported to another location. Built-in charging system in a Trailer ensures the lights are ready-to-use at any time.

S4GA received a contract for Portable Airfield Lighting Trailer. One month after placing the order, AGL system has been delivered to the air base.
CASE STUDY
NORTHEAST AFRICA MILITARY AIR BASE

S4GA PRODUCTS

PORTABLE RUNWAY EDGE LIGHT
PORTABLE RUNWAY THRESHOLD END LIGHT
UR-101 HANDHELD CONTROLLER
DIESEL GENERATOR

APPLICATION PHOTOS
CASE STUDY
NORTH AFRICA
REMOTE MILITARY AIRBASE

PROJECT KEY FACTS

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OVERVIEW

S4GA supplied complete permanent solar airfield lighting system to military airbase located in African desert. This is the second project that S4GA did for the current Customer.

In 2015 S4GA delivered solar airfield lighting system to their another air base. The Customer was satisfied with S4GA products and, few years later, they requested S4GA for the second solar AGL system.

CHALLENGE

According to Customer’s requirements, airfield lighting system had to be delivered and installed within only 4-week time. Traditional hard-wired runway lighting is impossible to install in such short period of time. Thus, the Customer started looking for alternative solutions.

Another challenge was lack of reliable constant power supply in the region. For airport it means sudden interruptions in airfield lighting work and acquisition of additional power generators to secure such interruptions.

SOLUTION

S4GA solar airfield lighting system has been already recognized as the best solution for remote airfields among civil and military customers.

S4GA lighting does not require any electrical infrastructure - the system operates 365 days on solar energy. No cables, CCRs, transformers, or any other electrical network is needed which makes installation of S4GA system much faster and easier than traditional hard-wired lighting.

Airfield lights are equipped with built-in power banks providing high level of autonomy of the lights. Each light is also connected to individual optimally tilted solar panel. In this way, every lighting unit in S4GA system has its own distributed power source and is independent from the other units. Due to power balance between energy consumed by lamps and energy produced by solar panels, S4GA solar AGL does not require any additional power sources except the sun.

S4GA runway lighting was manufactured, delivered and installed at the airbase within 4-week time as required. Now airbase is ready for night flight operations.
CASE STUDY
NORTH AFRICA REMOTE MILITARY AIRBASE

S4GA PRODUCTS

SOLAR RUNWAY EDGE LIGHT
SOLAR RUNWAY THRESHOLD END LIGHT
SOLAR TAXIWAY LIGHT
TAXIWAY EDGE RETRO REFLECTIVE MARKER

PAPI LIGHT
UR-3 PAPI CONTROLLER-CONVERTER
SOLAR ENGINE FOR PAPI
WIND DIRECTION INDICATOR

UR-201 CONTROL & MONITORING UNIT
ALCMS BASIC
OCT-401 BACKUP CHARGER

S4GA AIRFIELD LIGHTING LAYOUT

APPLICATION PHOTOS
CASE STUDY
LITHUANIA
KAUNAS AIRPORT

PROJECT KEY FACTS

Location: Lithuania
Application: Domestic Airport
Solution: Solar Runway Lighting System
Products: Solar Runway Edge Lights, Solar Runway Threshold End Lights, Solar Taxiway and Apron Lights, UR-201 Control & Monitoring Unit, UR-101 Hand-held Controller
Buyer: Kaunas Municipal Government
Year of Delivery: 2019

OVERVIEW

S. Darius and S. Girenas Airport (or Aleksotas Airport) is a domestic Lithuanian aerodrome located near the city of Kaunas. This is a civil airport which is primarily used by local flight schools and air clubs.

In 2017, local government decided to renovate airport for business and general aviation. The renovation program included installation of airfield lighting system at an aerodrome. The aerodrome was never equipped with any AGL system before.

The main challenge for airport management was to find cost-effective, and ICAO certified high-quality airfield lighting system. Due to limited budget set by government for this project, all offers received from suppliers of traditional hard-wired runway lighting, have been rejected. Airport budget was not enough for traditional wired runway lighting.

In the meantime, portable airfield lights – which were much cheaper - did not fit airport needs. Portable lights are designed for temporary usage, they require recharging from time to time. Whereas Kaunas Airport was looking for permanent lighting system. Airport management started looking for alternative solutions. They approached S4GA – EU-based manufacturer of certified airfield lighting systems – and requested the offer.

S4GA offered permanent solar runway lighting system certified and compliant with ICAO regulations. The system is designed for permanent applications, it operates 365 days on solar energy. Control and monitoring of AGL is performed by UR-201 Unit installed in the ATC room. The Unit allows AGL control from the ground and from the air.

Installation of S4GA system was done by FIMA – one of the leading systems integrators working in Baltic Region. For this airport, FIMA engineers designed special mounting stakes for ground surface. It saved runway surface from drilling the holes for standard mounting plates.

The cost of S4GA solar airfield lighting was few times less than traditional cabled lighting. The Customer was satisfied with S4GA system in terms of both financial and technical outcome.
CASE STUDY
LITHUANIA
KAUNAS AIRPORT

S4GA PRODUCTS

SOLAR RUNWAY EDGE LIGHT
SOLAR RUNWAY THRESHOLD END LIGHT
SOLAR TAXIWAY LIGHT
UR-201 CONTROL & MONITORING UNIT

UR-101 HANDHELD CONTROLLER

APPLICATION PHOTOS