DIRECT ANSWER

An approach lighting system inspection verifies that the array a crew sees on the extended centreline has the right shape, colour and intensity build-up. TarmacView flies the approach by drone, measures every unit's colour, relative intensity and coverage, times the sequenced flashing row, and returns a protocol in ICAO, EASA or FAA format the same day.

APPROACH LIGHTING SYSTEM · ICAO ANNEX 14

The approach lighting system, seen the way the crew sees it

An approach lighting system is judged from the air, on the centre line, descending. So that is where we measure it. One descent flies the length of the array on the nominal glide path and returns pattern, colour, intensity build-up, coverage, dimming and the flashing row, unit by unit.

Scope a lighting inspection

How the visit works

120 ± 30 flashes per minute, sequenced row	**1°–16.5°** vertical coverage sector
±15° horizontal coverage sector	**3** annex 14 systems supported

FIT

Who this is for

This service is bought by the person who has to sign the approach lighting rows of the visual aids protocol and knows that the array has never been looked at from where it matters. It fits the electrical manager with a periodic protocol due, the operator who just extended or converted the system and needs the pattern proven from the air, and the aerodrome answering a crew that said the approach looked incomplete.

FOR

- ✓ Airfield electrical and maintenance managers who owe their authority a periodic visual aids protocol for the approach lighting and currently produce it from a ground check and a pilot's word.
- ✓ Aerodrome operators whose approach system was just installed, extended or converted to LED and who need the pattern proven from the air before it is relied on.

- ✓ Aerodromes answering a pilot report that the approach looked wrong, incomplete or dim, where a count of lit units cannot say which part of the pattern the crew was missing.

NOT FOR

- × Certified absolute photometry of individual fixtures, which is done with a calibrated photometer at the unit rather than from the air.
- × Electrical faults in the circuits, regulators or the flashing system's timing hardware, which the protocol can point to through the units that misbehave but does not diagnose.
- × Instrument approach procedure design or minima, which take the lighting into account but are not a lighting measurement.

JUDGED ON DELIVERY

Outcomes and acceptance criteria

Three outcomes are what the service is judged on, and each has a state you can check on delivery rather than a promise you have to trust.

01

A pattern verdict from the pilot's eye view

The array as a whole is judged from the descent: the right shape for the system installed, every crossbar and side row where it belongs, the colour build-up correct, and the threshold bar reading brighter than the units ahead of it.

ACCEPTANCE

The protocol shows the array as seen from the nominal glide path, with any gap or wrong colour marked on it.

02

A record for every unit in the array

Each unit comes back with its colour, its intensity relative to its section, its coverage and its position, scored against the standard and against the units around it, so the fixtures to attend to are listed in the order the work should be done.

ACCEPTANCE

Pick any unit, and its figures, its verdict and the frames they came from are there.

03

A protocol the authority recognises as evidence

The approach lighting rows of the visual aids protocol in ICAO, EASA or FAA wording, with the flight record and the source frames attached to every finding, including the count behind the flashing rate.

ACCEPTANCE

The document files as the periodic check without being retyped into another form.

What the service does not undertake to produce is a diagnosis of the circuits or the flashing system's controller. A unit that reads low or fires out of turn is named, and why it does so is the electrician's question. Nor is it certified absolute photometry, which needs a calibrated instrument at the fixture. Where the question is the whole airfield's lighting rather than one array, the airfield lighting inspection page sets out how the systems fit into one visit.

Built around how the array is actually laid out

An approach lighting system is not a line of identical lamps. The inspection is modelled on the real thing.

Centre line, crossbars and

side rows, each in its own right

Your array is held as individual units on the extended centre line, each one carrying its ICAO Annex 14 system type, where it sits in the row, and the colour it is meant to show. Annex 14 gives an approach system two steady colours: variable white down the centre line and through the crossbars, red on the CAT II/III side row barrettes. A unit deliberately out of service is marked as such, so it is skipped rather than scored as a fault. All three Annex 14 systems are supported, simple, CAT I, and the shared CAT II/III layout.

One descent, the whole array, plus the static checks

The descent starts a kilometre back of the threshold, pushed further out when it needs to be so the pass clears the outermost unit of your

array by a margin, then flies down the published glide path and finishes in a hover at the minimum eye height over the threshold. It opens with a standing observation off the end of the array, which is where the attenuation and dimming steps are stepped through and where the sequenced flashing row is timed. Because the drone can hold a fixed point, a flashing row can be counted and a dimming step can be watched settle, neither of which a moving aircraft can do.

VERIFIED PARAMETERS

What the protocol answers

The approach lighting rows of the visual aids protocol, each with the tolerance it is judged against.

9 PARAMETERS | ICAO ANNEX 14 VOL I

01 Pattern configuration

The approach pattern is the correct shape for the system installed, with every crossbar and side row where it belongs.

TOLERANCE Per ICAO Annex 14

02 Chromaticity

Each unit shows the colour its position calls for, variable white on the centre line and crossbars, red on the CAT II/III side rows.

TOLERANCE Per ICAO Annex 14

03 Intensity build-up

Intensity rises through the approach to the point where the threshold bar reads brighter than the approach units ahead of it, with all units set symmetrically.

TOLERANCE Symmetric across units

04 Horizontal coverage

The pattern stays visible across the sector either side of the runway axis, measured out from the end of the array.

TOLERANCE min ±15°

05 Vertical coverage

The pattern stays visible on the runway axis through the whole approach elevation band.

TOLERANCE 1° to 16.5°

06 Dimming steps

Every unit changes intensity together and by the commanded step, and the runway system stays visible alongside it rather than being washed out.

TOLERANCE 3 of 3 steps

07 Sequenced flashing row

Intensity is sufficient, the units fire in the direction of flight toward the threshold, and the rate is correct.

TOLERANCE 120 ± 30 / min

08 Minimum eye height

The visual guidance seen over the threshold matches the published minimum eye height.

TOLERANCE Correct sector indication

09 Misleading lights

No light on the approach can be mistaken for part of the system, and none dazzles the crew.

TOLERANCE None recorded

- Tolerances per ICAO Annex 14 Vol I and ICAO Doc 9157 Part 4. Protocols are issued in your authority's format for ICAO, EASA or FAA.

DELIVERY · 6 STEPS

From array model to signed protocol

01

Scoping call

You name the runway ends, the system type on each, the published glide path and minimum eye height, and any units out of service. We agree the intensity steps to be checked and the protocol template your authority wants. Output is a scope note. If the array's layout is not documented, the first visit records it.

02

Mission build

The array is modelled unit by unit from the layout and the system type, and the descent, the hover point off the end of the array and the coverage sweep are generated from it, so the outermost unit is cleared by a margin and every unit is framed. Output is a validated mission, a capture window request to your tower and a request to your lighting control room for the steps.

03

04

Capture

Flown between aircraft movements, about an hour on site per system. The hover off the end of the array comes first, for the dimming steps and the flashing row, then the descent down the published glide path to the hover over the threshold. If a movement interrupts a pass, the pass is reflown unchanged.

Measurement

Each unit is tracked through the descent and its colour, relative intensity, coverage and position are extracted. The flashing row is counted over many cycles from the hover footage. Every figure is set against the array, so a unit is scored both against the standard and against its section. Uncertain frames are held for review rather than dropped.

05

Protocol

The approach lighting rows of the visual aids protocol are filled in your authority's wording, with a figure and a verdict per unit, the pattern verdict from the descent and the flashing count. Delivered the same day, with the flight record and the source frames attached.

06

Delivery and walkthrough

We walk your electrical manager through the units that sit furthest from their section and anything the descent showed as a gap. Anything disputed is re-examined against the retained footage rather than re-flown.

CAPTURE · ONE DESCENT ON THE NOMINAL GLIDE PATH · HOVER AT MEHT

EVIDENCE AND CAPABILITY

The claim worth checking is the pattern

An approach lighting system is specified as a pattern seen from a moving point, and a pattern can be wrong in ways no fixture reveals. Every crossbar can be lit and the array still reads as a gap if one barrette is aimed low, or as two systems if the light intensity does not

build toward the threshold. The inspection therefore flies the pattern as the crew flies it, on the extended centreline at the nominal glide path , and the pattern verdict is what the descent shows. The per-unit figures come from the same footage, with each unit tracked through the descent and scored against its own section of the array.

The static checks are done from a hover, and that is where a drone earns its place. The sequenced flashing lights are counted over many cycles from a fixed point off the end of the array, and their direction is read from the sequence itself. A dimming step is commanded and watched settle, with the runway lights in the same frame, so the row of the protocol that asks whether the runway system stays visible beside the approach system is answered by looking rather than by assumption.

The intensity figures are relative, unit against its section and section against section, which is what the build-up and symmetry rows ask for. An airborne camera is not a calibrated photometer, so an absolute value in candela needs an external reference, and where an authority requires one it is arranged at scoping. The chromaticity of each unit is read from the same footage, which is how a red side row barrette that has drifted toward orange is caught, and each unit's position comes from RTK positioning , so a unit that has been moved or reinstalled off the line is named.

Retained footage is what makes a disputed finding checkable. If your inspector questions the flashing count or a unit's figure, the frames are still there, and the count or the figure can be redone in front of them. That is also what lets the next visit report change, unit by unit, rather than a fresh opinion of the array.

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ARRAY VS FIXTURE
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`1 descent`

covers the whole array from where the crew sees it

`hover`

for the flashing count and the dimming steps

`relative`

intensity, unit against its section and its own steps

HOW THE PRICE IS BUILT

Four things move the quote

There is no published rate for this service, because a simple approach system with a handful of units and a CAT II/III array of several hundred are different days of work off the same method. The quote gives your figure, and the pricing page describes the combined visit.

EUR · PER AERODROME PER VISIT · EXCL. VAT · EU

CHECKED 2026-09-08

Cost driver 01

Systems and their type

A simple system, a CAT I array and a CAT II/III array differ

Cost driver 02

Runway ends

Each approach system is its own descent and hover. Two

by an order of magnitude in units, and processing scales with them.

ends at one aerodrome share the setup and the tower coordination.

Cost driver 03

Combined visit

Measuring the PAPI and the runway edge lights, or scanning the pavement, in the same visit costs less than buying each separately, because the travel and the access are paid once.

Cost driver 04

Travel

Shows up as travel and not as a different inspection.

Tell us the aerodrome and the runway ends and you get a figure and a date back. The pricing page sets out the shape of a visit that covers every light and every surface, which is the cheaper way to buy the lighting protocol as a whole.

EACH WITH AN OWNER

Risks and dependencies

Three things can stop or degrade an inspection, and each has an owner.

OWNER · WEATHER

OWNER · OPERATOR

Visibility and wind

The colour and intensity of a unit have to be read cleanly along a kilometre of approach, so fog, precipitation and low sun on the axis stop the capture. Wind above the drone's limit stops it too. The mission is flown when the window opens rather than measured through the weather.

Access and lighting control

The capture needs tower coordination, an escort at most aerodromes, and a control room that can command the intensity steps and the flashing system while the drone holds off the end of the array. The approach may also cross land outside the aerodrome boundary, which is a permission the operator is best placed to arrange.

OWNER · BOTH, AT SCOPING

The array model

A unit is scored against the system type, its row and its expected colour. If units were added, removed or reconfigured since the layout was documented, the scoring is against the wrong array. We agree at scoping whose layout is used, and a first visit without one records it.

Accountability sits with TarmacView for the capture, the measurement and the protocol, and with the aerodrome operator for access, for the lighting control and for what is done with the findings. Nothing on this

page is a compliance statement. Whether a given protocol satisfies a particular authority is a question for that authority.

Frequently Asked Questions

Why is the array measured from the approach rather than from the ground?

Because an approach lighting system exists to be seen from one place: on the extended centreline, descending toward the threshold. A crossbar can be complete from the ground and still read as a gap from the air if a unit's beam is aimed wrong. The drone flies the length of the array on the nominal glide path, which is where the pattern has to be right, and the protocol reports what it saw from there. The ground checks that need a fixed point, the dimming steps and the flashing rate, are done from a hover off the end of the array.

Which systems do you cover?

The three Annex 14 layouts: the simple approach lighting system, the CAT I precision approach system with its centreline barrettes and crossbars, and the shared CAT II/III layout with its red side rows over the inner section. The array is held unit by unit with the system type, the row each unit belongs to and the colour it is meant to show, so the check is against the pattern your runway was certified with rather than a generic drawing. Runway threshold lights and the sequenced flashing row are covered as part of the same descent.

Is the runway closed for the inspection?

No. The descent and the hover off the end of the array are flown between aircraft movements in coordination with the tower, and the drone clears the approach when asked. The approach lights have to be on at the intensity steps being checked, which is a request to your lighting control room. Budget about an hour on site per approach system for setup, the passes and a repeat if a movement interrupts one. Processing and the protocol happen afterwards, off site.

How do you check the sequenced flashing row?

From a hover at a fixed point off the end of the array, where the whole row is in frame. The footage shows each flash and the order in which the units fire, so the rate is counted over many cycles and the direction, toward the threshold, is confirmed from the sequence itself. A unit that fires out of turn or not at all is named. This is one of the checks a moving aircraft cannot do well, because it needs to stay in one place long enough to count.

How is intensity reported?

As a figure per unit relative to the array and relative to the commanded dimming step, which is what the build-up, symmetry and dimming rows of the protocol ask for. The build-up row checks that intensity rises through the approach so that the threshold bar reads brighter than the units before it. An absolute value in candela needs an external reference, because an airborne camera is not a calibrated photometer, and where your authority requires one it is arranged at scoping.

What comes back if a unit is deliberately out of service?

Nothing that counts against you. A unit you have marked out of service is held as such in the array model and is skipped rather than scored as a fault. The protocol lists it so the record is complete, and if it is back in service by the next visit it is measured then. A unit that is dark without being marked is a different matter, and it is reported on the day of capture as a serviceability finding.

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