DIRECT ANSWER

An approach obstacle clearance check establishes whether anything rises into the obstacle protection surface over a runway approach. TarmacView builds the surface from the runway geometry and Annex 14 dimensions, tests every surveyed obstacle against it, then flies the surface so that anything penetrating it crosses the camera's sightline, and reports each penetration with a position and top height.

OBSTACLE PROTECTION SURFACE · ICAO ANNEX 14

Proof that nothing has grown into your approach

The protection surface over an approach is a plane, and the only question that matters is whether anything crosses it. We fly an arc that rides on that plane and hold the camera on a point that also lies on it, so any object breaking through visibly cuts the sightline on camera. Vegetation, a new roofline, a crane that was not there last year.

Scope a clearance check

How the visit works

2 000 m arc radius out on the approach	−0.57° plane set below the glide path
15% surface divergence, annex 14	±15° sector swept either side of the axis

FIT

Who this is for

This service is bought by the person who has to sign that the approach surface a crew relies on is clear, and knows that the last survey is a statement about the day it was made. It fits the operator closing out works near the approach, the manager of a regional aerodrome with woodland under the glide path, and the aerodrome that has just re-aimed its PAPI and moved the plane with it.

FOR

- ✓ Aerodrome operators who have to show, after works near the approach or a season of growth, that nothing now rises into the obstacle protection surface before an inspector asks.
- ✓ Airfield managers at regional and general aviation aerodromes where vegetation rather than construction is the obstacle that grows between surveys.

- ✓ Aerodromes commissioning or re-aiming a PAPI, where the protection surface moves with the set angle and has to be shown clear at the new geometry.

NOT FOR

- × A survey of every obstacle limitation surface around the aerodrome, approach, take-off climb, transitional, inner horizontal and conical, which is a larger service scoped separately.
- × Certified obstacle data for AIP or terrain and obstacle data publication under Annex 15, which needs a licensed surveyor and a formal data chain.
- × The decision whether the PAPI can stay in service with a penetration present, which belongs to the operator and the authority.

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 clearance statement for a defined surface

The report names the surface it was run against, its origin, inner edge, divergence and slope, and states whether anything penetrates it, tested against your surveyed obstacles and again on the flown sightline.

ACCEPTANCE

The geometry the check used is written in the report, and it matches your published data or the Annex 14 default it fell back to.

02

A register entry for every penetration

Each object that breaks the surface comes back with its surveyed position, its measured top height with the uncertainty stated, how far above the plane it reaches and the frames that show it.

ACCEPTANCE

A landowner, a contractor or the authority can act on the entry without a second visit to find out what it means.

03

A flown record of the sightline

The whole arc is recorded with the drone's RTK position on every frame, so the finding that the surface is clear is a piece of evidence rather than an assertion, and can be reviewed later.

ACCEPTANCE

The footage is attached, and any frame can be tied to a position on the plane.

What the service does not undertake to do is decide whether the PAPI stays in service with a penetration present, or produce certified obstacle data for publication. The first belongs to the operator and the authority, and the PAPI protection surface check page sets out how that decision is usually reached after works or growth. The second needs a licensed surveyor and a formal data chain. A survey of every obstacle limitation surface around the aerodrome is a larger service, scoped separately, of which this check is the fastest-moving part.

A geometric check, then a visual one

The same surface is tested twice, once against your survey data and once against what the camera sees.

The surface is constructed,

not estimated

The protection surface is built for the runway direction from its own geometry: where the surface starts relative to the threshold, how wide its inner edge is, and how fast it diverges outward, using the ICAO Annex 14 values where you have not published your own. Its slope comes from your published figure, or is derived from the published glide path. Every surveyed obstacle on the airfield is then tested against that solid: does its footprint fall inside the surface, and does its top break through the plane above it. Anything that does both is named before the drone leaves the ground.

Then the sightline has to agree

Survey data goes stale, which is the whole reason for the flight. The arc is flown at the altitude the plane reaches at that radius, with the camera

locked on a safe point out on the extended centre line that sits on the same plane. That makes the sightline a physical sample of the surface: anything penetrating it passes in front of the camera rather than being inferred from a spreadsheet. The sweep either side of the runway axis covers the sector the crew uses, and the whole pass is on video, so the finding is evidence rather than an assertion.

VERIFIED PARAMETERS

What the report answers

The obstacle rows of the visual aids protocol, plus the geometry the check was run against.

7 PARAMETERS | ICAO ANNEX 14 VOL I

01 Surface penetration

No object breaks through the obstacle protection surface for the runway direction, tested against the surveyed obstacle set and again on the flown sightline.

TOLERANCE Not penetrated

02 Visual contact with runway elements

The runway lighting and markings stay in view all the way down the approach, with nothing screening them.

TOLERANCE Not obstructed

03 Surface slope

The plane the check is run on, taken from your published value or derived from the published glide path.

TOLERANCE Glide path − 0.57°

04 Surface geometry

Origin offset from the threshold, inner edge width and outward divergence used to build the surface.

TOLERANCE 60 m · 300 m · 15%

05 Horizontal sector

The arc sweeps the sector either side of the runway axis rather than sampling the centre line alone.

TOLERANCE min ±15°

06 Penetrating object detail

Each object that breaks the surface is reported with its surveyed position and top height, so the cut or the notification can be scoped.

TOLERANCE RTK ±1 cm

07 Evidence

The full approach pass is recorded, so the clearance finding can be reviewed rather than taken on trust.

TOLERANCE Video record

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

DELIVERY · 6 STEPS

From runway geometry to clearance statement

01

Scoping call

You name the runway ends, the published glide path, threshold and PAPI data, and send the obstacle register if one exists. We agree whether the check is combined with the PAPI inspection and which protocol template your authority wants. Output is a scope note that states the surface geometry the check will use.

02

Surface construction

The protection surface is built from the runway geometry and the set angle, with Annex 14 dimensions where you have not published your own. Every object in the register is tested against it as a computation. Output is the list of candidates, the objects that penetrate or come within a margin, before the drone leaves the ground.

03

Mission build

The arc is generated on the plane at the agreed radius, with the camera aim point on the extended centreline and on the same plane, and the sweep either side of the axis. Output is a validated mission and a capture window request to your tower, plus any permission needed

04

Capture

Flown between aircraft movements. The arc is flown with the camera locked on the aim point, and every candidate from the computation is then approached and measured with RTK positioning for its position and top height. If a movement interrupts the arc, it is reflown unchanged.

where the arc crosses land outside the boundary.

05

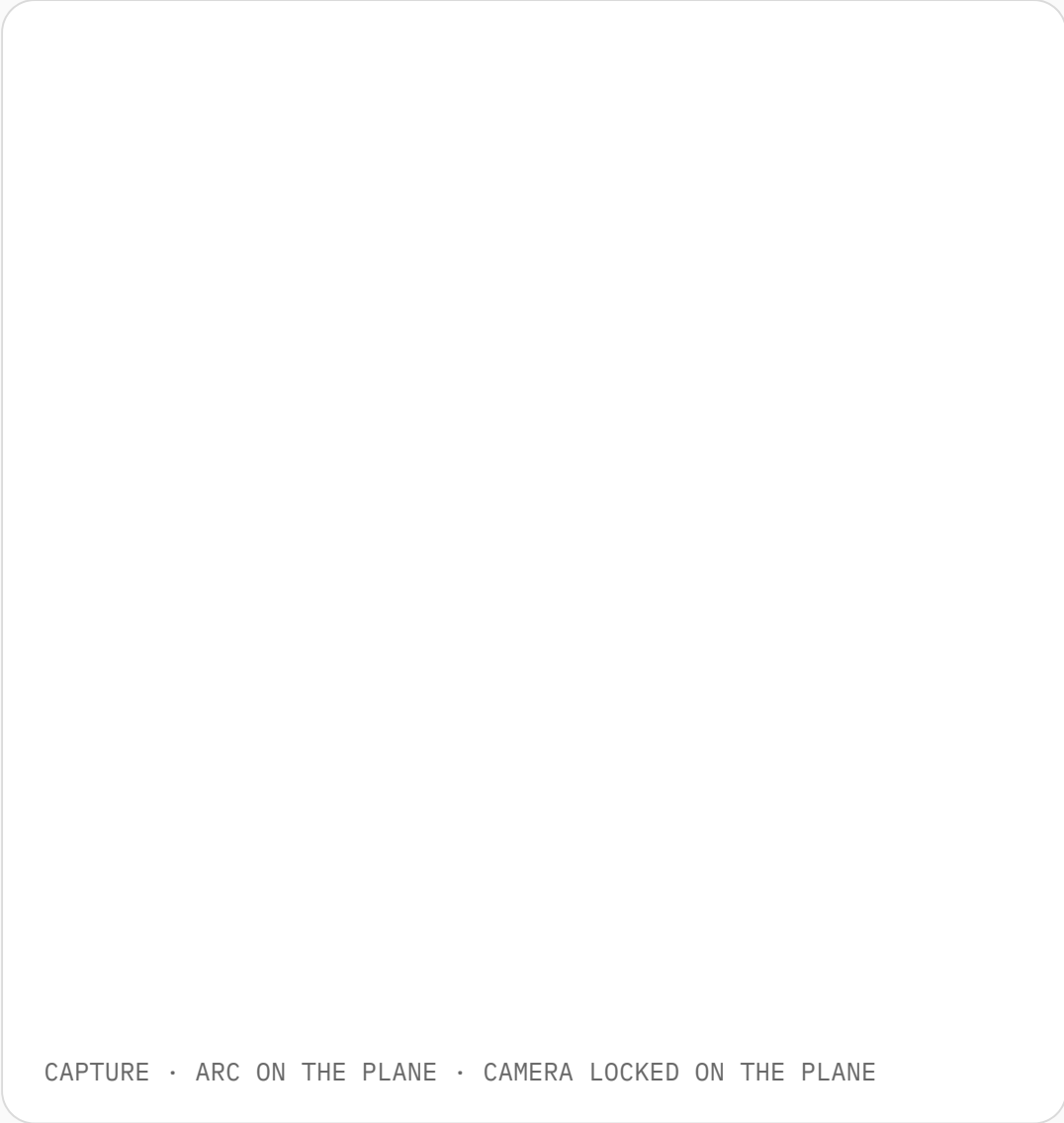
Measurement and register

The footage is reviewed frame by frame for anything crossing the sightline, and each candidate is measured against the plane: position, top height with its uncertainty, and how far above the surface it reaches. Anything seen on the arc that was not in the register is added to it.

06

Report

The obstacle rows of the visual aids protocol and the penetration register, in your authority's wording, with the surface geometry stated and the footage attached. Delivered the same day, with any penetration flagged on the day of capture so the operator can act before the report lands.



CAPTURE · ARC ON THE PLANE · CAMERA LOCKED ON THE PLANE

EVIDENCE AND CAPABILITY

The claim worth checking is the plane

A protection surface is a geometric object, and the honest way to check one is to construct it exactly and then test things against it. The surface for a precision approach path indicator starts near the threshold at a set width, diverges outward at a fixed rate and climbs at

an angle a little below the glide path the units are set to. Annex 14 gives the dimensions by runway type and code, and the aerodrome may have published its own. The check builds the plane from those figures and from the runway's own geometry, writes the geometry it used into the report, and tests every object in the obstacle register against it as a computation. Anything that penetrates or comes within a margin is a candidate before the visit begins.

The flight is what turns the computation into evidence. The register contains what was surveyed on the day it was surveyed and nothing else, and obstacle clearance is lost to the things it does not contain: a season of growth, a mast that was not notified, a crane on a permit that expired. The arc is flown at the height the plane reaches at that radius, with the camera aimed at a point on the extended centreline that also lies on the plane, so the sightline itself lies in the surface. Anything rising through the surface between the two passes in front of the camera. That is a physical sample of the plane, not an inference from a spreadsheet.

Where something is seen, it is measured. Its position and top height come from RTK positioning , and the report states the height above the plane with the uncertainty, in metres, so the finding can be handed to a landowner or a contractor as a number rather than an impression. The whole pass is retained, so a disputed entry is re-examined against the frames rather than re-flown, and a repeat check reports what has changed against the last one.

What the check does not cover is the rest of the obstacle limitation surfaces around the aerodrome, the take-off climb, transitional, inner horizontal and conical surfaces that reach kilometres out. That is a whole-aerodrome survey and a separate purchase. The approach is the part of that picture that changes fastest and is flown most easily, which is why it is sold on its own and combined with the PAPI inspection whenever both are wanted.

COMPUTED VS FLOWN

2 tests

every obstacle against the surface, then the surface on camera

on the plane

the arc and the aim point both lie in the surface

per object

position and top height with a stated uncertainty

HOW THE PRICE IS BUILT

Four things move the quote

There is no published rate for this service, because one approach with a current register and four approaches with a register from the certification 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

Cost driver 02

Runway ends

Each approach is its own surface, arc and candidate list. Two ends at one aerodrome share the setup and the tower coordination.

The register

A current register with surveyed heights gives a short candidate list. An old one, or none, means more candidates to fly and measure.

Cost driver 03

Combined visit

Checking the surface in the same visit as the PAPI inspection costs less than buying each separately, because the travel, the access and much of the flying are shared.

Cost driver 04

Travel

Shows up as travel and not as a different check.

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, and the PAPI inspection is the service this check most often travels with.

EACH WITH AN OWNER

Risks and dependencies

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

OWNER · WEATHER

Visibility and wind

The sightline has to be read over two kilometres of approach, so haze, precipitation and low sun on the axis stop the capture, and wind above the drone's limit stops the arc. The mission is flown when the window opens rather than judged through the weather.

OWNER · OPERATOR

Access and the published data

The arc needs tower coordination and may cross land outside the aerodrome boundary, which is a permission the operator is best placed to arrange. The surface needs the published glide path, threshold and PAPI data, because a plane built on the wrong angle tests the wrong volume. Both sit with the aerodrome operator.

OWNER · BOTH, AT SCOPING

The geometry

A clearance statement is only as good as the surface it was made against. Where the aerodrome has published its own dimensions or slope, they are used. Where it has not, the Annex 14 defaults are, and the report says which. We settle this at scoping and write it into the scope note so the surface is never a matter of interpretation afterwards.

Accountability sits with TarmacView for the surface construction, the flight and the measurements, and with the aerodrome operator for access, for the published data and for what is done with a penetration. Nothing on this page is a compliance statement. Whether a given check satisfies a particular authority, and whether the PAPI stays in service in the meantime, are questions for that authority.

Frequently Asked Questions

Which surface is checked?

The obstacle protection surface that Annex 14 defines for the visual approach slope indicator on that runway end. It starts a short distance in front of the threshold at a set width, diverges outward on both sides at a fixed rate and climbs along the approach at an angle slightly below the glide path the PAPI is set to. Its dimensions depend on the runway type and code, and the check uses the Annex 14 values where you have not published your own. Because the plane is built from the runway geometry and the set angle, it can be constructed exactly, and anything above it is by definition a penetration.

How is this different from an obstacle limitation surface survey?

In extent. This check covers the protection surface over one approach, which is the plane that decides whether a crew following the PAPI has anything in its way. An obstacle limitation surface survey covers the whole set of surfaces around the aerodrome, approach, take-off climb, transitional, inner horizontal and conical, reaching kilometres out, and is what an operator owes the authority as a statement of the aerodrome's surroundings. The clearance check is the part of that picture that changes fastest and is flown most easily, and it is often what is wanted after works or growth on the approach.

Why fly it if we have a surveyed obstacle register?

Because the register tells you what was surveyed on the day it was surveyed. The check tests every object in it against the surface as a computation, before anyone flies, and names any that penetrate. What the register cannot contain is the objects nobody surveyed, the tree that grew, the mast that was not notified, the temporary crane. The flight along the surface is what finds those. The two halves together are the check. The register alone is a statement about the past.

How does a flown arc prove the surface is clear?

The drone flies an arc out on the approach at the height the surface plane reaches at that distance, with the camera locked on a point on the extended centreline that also lies on the plane. The sightline from the camera to that point therefore lies in the surface, and anything rising through the surface between the two passes in front of the camera. The sweep either side of the runway axis covers the sector a crew uses, and the whole pass is recorded, so the clearance finding is evidence rather than an assertion. Where a candidate is seen, it is then measured.

What do we get for a penetration?

An entry with the object's surveyed position, its measured top height with the uncertainty stated, how far above the surface it reaches, and the frames that show it. That is what a landowner needs to agree a cut, a contractor needs to lower a crane, and the authority needs to record the finding. What you do not get is the decision about whether the PAPI can stay in service in the meantime. That is the operator's and the authority's, and it usually depends on how far the penetration is from the on-slope signal.

How often should the approach be checked?

Often enough that a penetration is caught before an inspector or a pilot report catches it. A poplar can add a metre a year, and a line of them at the edge of the approach can cross a surface that slopes at a few degrees within a couple of seasons. Aerodromes with woodland under the approach tend to check annually, in winter when the canopy is at its lowest. Aerodromes with cleared surroundings check when something changes: a permit, a crane, a works handover, a re-aimed PAPI. Combining the check with the PAPI inspection puts both on the same visit.

References

`icao-annex-14-v1` Annex 14 to the Convention on International Civil Aviation, Volume I: Aerodrome Design and Operations
International Civil Aviation Organization

`icao-doc-9157-p4` Doc 9157, Aerodrome Design Manual, Part 4: Visual Aids
International Civil Aviation Organization

`icao-doc-9137-p6` Doc 9137, Airport Services Manual, Part 6: Control of Obstacles
International Civil Aviation Organization

easa-cs-adr-dsn-7	Certification Specifications and Guidance Material for Aerodrome Design, CS-ADR-DSN Issue 7 (https://www.easa.europa.eu/en/document-library/certification-specifications/cs-adr-dsn-issue-7) European Union Aviation Safety Agency
tarmacview-pricing	Pricing: one visit, every light and every surface (https://www.tarmacview.com/pricing/) TarmacView

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