

Solar Development Near Airports

**FAA Glare Compliance, Perimeter
Infrastructure, and Vertical Bifacial
Applications**

Aviation Safety · FAA Compliance · Renewable Energy

SITE DESIGN QUESTION

**Can constrained airport land produce
energy without compromising safety?**

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For airport operators, solar
developers, aviation safety officers,
and regulatory compliance teams.

Airport solar is a safety-first, land-constrained design problem

Five linked questions determine whether a concept is defensible.

This brief is for airport operators, solar developers, aviation safety officers, and regulatory compliance teams evaluating solar on airport property.

FAA compliance

The 2021 Final Policy focuses formal review on potential glint or glare in the air traffic control tower cab.

Reflection geometry

Panel tilt and orientation determine where reflected light travels; vertical east-west systems may reduce upward-directed reflections.

Perimeter deployment

Fence-line corridors can combine security infrastructure with distributed generation without displacing operational land.

Simulation

SGHAT, now commercially available through ForgeSolar, remains the de facto industry method supporting Form 7460-1 self-certification.

Wind engineering

Exposed airport sites require early structural, foundation, and local-code analysis.

Energy alignment

East-west bifacial output can shift production toward morning and late-afternoon demand windows.

The 2021 FAA policy narrowed the glare question to the ATCT cab

Solar installations at federally obligated airports with air traffic control towers are governed by the FAA's 2021 Final Policy, 86 Fed. Reg. 25801, which superseded the 2013 Interim Policy.

- **Current scope:** Airports must confirm there is no potential for glint or glare within the ATCT cab.
- **Removed requirement:** The FAA no longer treats glare reaching pilots on final approach as a required review condition, comparing it with reflections from water, glass façades, and parking lots.
- **Self-certification:** The airport uses FAA Form 7460-1 to certify that the proposed installation will not create a visual hazard; the underlying analysis is not routinely submitted for FAA review.
- **Residual obligation:** The FAA can require mitigation at the airport's expense if an impact is discovered later.

Glint is a momentary flash of reflected light. **Glare** is a sustained reflection capable of causing after-image effects and remains the ATCT-cab standard.

86 Fed. Reg. 25801 · May 11, 2021 · superseded the 2013 Interim Policy

SGHAT and ForgeSolar remain the practical path to glare evidence

SGHAT was originally developed with Sandia National Laboratories. ForgeSolar licensed and incorporated it into a commercial platform widely used by aviation consultants. Its continued dominance reflects industry practice, not an active FAA mandate, because the 2021 update withdrew formal endorsement of a specific required tool.



01 Solar position

Model reflection angles across the full calendar year.

02 Panel geometry

Test tilt, azimuth, and reflected-light direction.

03 Observers

Evaluate the ATCT cab and any additional receptors requested by the airport or local jurisdiction.

04 Hazard classification

Distinguish no impact, low potential for after-image, and potential ocular hazard.

An acceptable ATCT-cab result supports Form 7460-1 self-certification. Broader flight-path modeling may still be requested as due diligence or by local and state authorities.

Panel orientation changes the reflection pathway

Because reflection angle equals incidence angle, solar position and panel orientation make the direction of reflected light predictable. Simulation is therefore necessary and reliable even when formal review focuses on a limited set of receptors.



Tilted arrays

Traditional 20–35° systems can reflect sunlight upward at certain times and seasons toward aircraft, towers, roads, or buildings.

Vertical arrays

Panels near 90°, typically bifacial and east-west facing, direct reflections more laterally along the ground rather than upward toward flight paths.

Design implication

Vertical geometry may reduce upward-directed reflections, but site-specific modeling remains the appropriate way to confirm ATCT compliance.

Airport wind exposure makes early structural analysis essential

Airports are exposed, high-wind environments with limited natural windbreaks. Solar structures near runways and open areas must withstand applicable wind loads with appropriate safety factors.

- **Aerodynamic behavior:** vertical systems have a narrower profile and may distribute loads more predictably laterally rather than as uplift, but this must be verified rather than assumed.
- **Wind characterization:** use wind-tunnel testing or CFD to account for prevailing direction, terrain roughness, and nearby structures.
- **Structural modeling:** evaluate dead loads, wind loads, dynamic response, overturning, and lateral resistance.
- **Foundation design:** complete geotechnical analysis for piles or other foundations.
- **Code compliance:** verify against ASCE 7 and local exposure-category requirements.



Fence-line corridors can add generation without consuming operational land

Runway safety areas, taxiway object-free areas, FAR Part 77 height restrictions, and TSA security perimeters constrain conventional ground-mounted solar. Fence-line infrastructure offers a way to co-locate generation with existing security, noise-barrier, and roadway functions.

- **Best fit:** land-constrained or urban airports seeking distributed generation rather than a central solar field.



- **Form factor:** vertical bifacial systems align with the linear, upright geometry of airport security fencing.
- **Planning test:** identify corridors that respect safety areas, height limits, access requirements, and maintenance operations.

East-west bifacial output can better match airport demand windows

South-facing arrays concentrate production around solar noon, while airport demand can rise during early-morning departure waves and late-afternoon or evening arrival banks, with continuous overnight security and lighting loads.

Temporal shift

East-west bifacial systems, including vertical configurations, can move more production toward morning and late afternoon.

Operational value

The profile may align better with airport demand peaks and time-of-use pricing windows.

Decision rule

Evaluate production timing alongside annual yield, glare compliance, land constraints, and structural cost.

AIRPORT SOLAR DECISION FRAMEWORK

CONSIDERATION	KEY ACTION	PRIORITY
ATCT glare assessment	SGHAT/ForgeSolar simulation confirming no ATCT-cab impact	Required (FAA)
Broader flight-path glare review	Additional modeling as best practice or local/state requirement	Recommended
FAA Form 7460-1	Self-certify no visual hazard	Required
Land-use constraints	Respect safety areas and height limits	Constrained
Wind-load engineering	Analyze to ASCE 7 and local exposure category	High
Perimeter integration	Evaluate fence-line and barrier corridors	Important
Energy-demand timing	Assess production alignment with demand and TOU pricing	Operational

References & contact

REFERENCES

FAA Policy: Review of Solar Energy System Projects on Federally-Obligated Airports, 86 Fed. Reg. 25801 (May 11, 2021).

FAA Interim Policy (2013), superseded and retained for historical context. FAA Form 7460-1, Notice of Proposed Construction or Alteration. SGHAT, Sandia National Laboratories; ForgeSolar Software Documentation.

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Let's talk about your site.

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