CIVIL AVIATION AUTHORITY OF FIJI

GUIDANCE MATERIAL

Installation of Solar Photovoltaic (PV) Systems at or within the Airport Vicinity

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PREFACE

The Civil Aviation Authority of Fiji (CAAF) publishes this Guidance Material (GM) to provide supplementary information to the Authority's Standards Documents.

This GM provides guidance to aerodrome operators, solar PV developers and contractors, other stakeholders, and CAAF staff on the process and safety considerations for the installation of solar photovoltaic (PV) systems at or within the airport boundary, or within the airport vicinity.

This GM explains regulatory requirements by providing interpretive and explanatory material. It does not, of itself, create new legal obligations. Where there is any inconsistency between this GM and applicable legislation or regulations, the legislation or regulations prevail.

Chief Executive
Civil Aviation Authority of Fiji

RECORD OF AMENDMENTS AND CORRIGENDA

AMENDMENTS

No.	Date applicable	Date entered	Entered by
1	06/01/26	06/01/26	AI-ES
2			
3			

CORRIGENDA

No.	Date of issue	Date entered	Entered by

ABBREVIATIONS

ACI	Airports Council International
AIP	Aeronautical Information Publication
AOC	Air Operator Certificate
ANR	Air Navigation Regulations 1981 (as amended)
ATC	Air Traffic Control
ATZ	Aerodrome Traffic Zone
CAAF	Civil Aviation Authority of Fiji
CNS	Communication, Navigation and Surveillance
EMI	Electromagnetic interference
FAA	Federal Aviation Administration
ICAO	International Civil Aviation Organization
NEP	National Energy Policy
OLS	Obstacle Limitation Surfaces
PV	Photovoltaic
RSA	Runway Safety Area
ROFA	Runway Object Free Area
SDG	Sustainable Development Goal
SPV	Solar Photovoltaic

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1. INTRODUCTION

1.1 Purpose

This GM sets out a practical method for CAAF inspectors and stakeholders to identify, assess and manage aviation safety risks associated with solar PV installations at or within the airport boundary, or within the airport vicinity. The key risks addressed include obstacle penetration, glint and glare, and other operational hazards that may affect aircraft operations.

1.2 Scope and Applicability

This guidance material applies to: -

a) CAAF staff involved in aerodrome, airworthiness, flight operations, air navigation and safety oversight.
b) Aerodrome certificate holders and aerodrome operators; and
c) Solar PV developers/contractors and any entity proposing to install solar PV systems within the airport boundary or within the airport vicinity.

1.3 Definitions and Terminology

Aerodrome – A defined area on land or water (including any buildings, installations, and equipment) intended to be used either wholly or in part for the arrival, departure, and surface movement of aircraft.

Aerodrome Certificate – A certificate issued by the Authority under applicable legislation for the operation of an aerodrome.

Aerodrome Certificate Holder – an entity or individual that holds an aerodrome certificate issued by the Authority.

Aerodrome Operator - an entity or individual responsible for operating and managing an aerodrome.

Aircraft Operator – An operator holding a local or foreign Air Operator Certificate (AOC).

Airport Vicinity – For the purpose of this GM, the area within the aerodrome traffic zone (ATZ) and up to 8 km from the Aerodrome Reference Point (ARP), unless otherwise determined by CAAF for safety reasons.

Authority – means the Civil Aviation Authority of Fiji.

Solar Project Coordinator – A person designated by the proponent/developer responsible for overseeing the planning, submission, execution and completion of the solar PV project.

1.4 Regulatory and reference framework

Solar PV projects must comply with all applicable laws and requirements. This GM should be read in conjunction with, as applicable:

a) Civil Aviation Authority of Fiji Act 1979 (including CAAF's safety oversight functions);
b) Air Navigation Regulations 1981 (including provisions relating to endangering the safety of aircraft Section 70 (2) and dangerous lights section 139);
c) CAAF Standards Document – Aerodromes;
d) ICAO Annex 14, Volume I Aerodrome Design and Operations (identification of solar sites consistent with design,
e) ICAO Doc 9184 Airport Planning Manual, Part 2 - Land Use and Environmental Control (to assess the compatibility of project sites);
f) Aerodrome operator requirements, endorsed Aerodrome Master Plan(s), and local planning/environmental approvals.

2. SAFETY AND TECHNICAL CONSIDERATIONS

Ensuring aviation safety is critical when installing solar photovoltaic (PV) systems near airport boundaries. PV installations must not create obstacles, glare/visual distraction, or any other risk to aircraft—particularly during take-off, approach and landing.

Stakeholders must comply with CAAF requirements, aerodrome operator guidance, and relevant standards to ensure PV systems do not affect protected airspace, navigational safety, or ground operations. A coordinated, compliant approach enables renewable energy development while maintaining the highest aviation safety standards and public confidence.

2.1 Obstacle and safeguarding considerations

Solar PV installations must not create obstacles or hazards to aircraft operations. The developer/proponent and aerodrome certificate holder should consider (as applicable):

- Location relative to runway/taxiway protected areas (e.g., ROFA, RSA, taxiway object free/safety areas);
- Penetration of Obstacle Limitation Surfaces (OLS) and any relevant instrument procedure safeguarding surfaces;
- Temporary construction obstacles (e.g., cranes, scaffolding) and required NOTAM/AIS coordination; and
- Turbulence/wind-shear effects where arrays are installed in the vertical plane (e.g., plinths, towers) or above rooflines.

2.2 Glint and glare considerations

Glint and glare from reflective surfaces can distract or dazzle pilots and air traffic controllers, particularly during critical phases of flight. The developer/proponent must submit a technical glint and glare assessment acceptable to CAAF. The assessment should:

- Identify receptors (e.g., runway thresholds, approach/departure paths, ATC tower, apron and manoeuvring areas);
- Use an appropriate methodology/tool and clearly state assumptions (panel type, tilt/azimuth, tracking, elevation, reflectivity, terrain);
- Identify predicted days/times and intensity of any glare; and
- Propose mitigations where predicted glare is not acceptable.

Note - if glint or glare impacts are discovered after construction, the owner of the solar structure, must mitigate them at its expense.

2.3 CNS/EMI and other operational considerations

Depending on proximity to CNS facilities, CAAF may require evidence that the project will not cause unacceptable electromagnetic interference (EMI) to communication, navigation or surveillance systems. CAAF may also consider:

- Security and access arrangements for airside works;
- Wildlife attraction and environmental impacts; and
- Fire safety, emergency access and hazardous materials considerations.

2.4 Environmental Requirements

Addressing environmental requirements for solar PV installations helps comply with regulations and promotes sustainable practices that can contribute positively to local ecosystems and communities.

On 26 January 2024, following broad consultation, Fiji's Department of Energy launched the Fiji National Energy Policy 2023-2034 (NEP). This policy outlines an ambitious implementation plan, led by the Department of Energy, to meet Fiji's international climate change targets and align with Sustainable Development Goal 7 (SDG 7).

The endorsement of Fiji's new National Energy Policy marks a significant policy shift towards a more holistic and balanced approach to the governance, decarbonization, and resilient development of Fiji's energy sector. The policy focuses on strategies to improve the enabling environment for new investment in renewable energy. Central to its implementation will be the upcoming review of the Electricity Act (2017) and the effort to update this legal framework to better comply with Fiji's current and future energy needs (Lund 2024).

3. APPLICATION AND ASSESSMENT PROCESS

3.1 Overview of the process

High-level workflow:

1) Early engagement (aerodrome operator + CAAF) ->
2) Prepare submission package (plans + assessments) ->
3) Submit to CAAF (via aerodrome certificate holder for on-aerodrome projects) ->
4) CAAF screening and technical review ->
5) Decision (consent/conditions/request for further information/refusal) ->
6) Construction controls and notification ->
7) Post-installation verification and ongoing monitoring.

3.2 Submission pathways

a) On-aerodrome projects (within the airport boundary): The aerodrome certificate holder shall coordinate the submission to CAAF.
b) Off-aerodrome projects (within airport vicinity): The developer/proponent shall consult the relevant aerodrome operator and submit to CAAF, with evidence of consultation.

3.3 CAAF review and outcomes

CAAF will review submissions for completeness and assess aviation safety impacts. Where a full Safety Assessment is required, CAAF will notify the developer/proponent in writing. CAAF's target timeframe to provide an outcome, once a complete submission is received, is 20 working days (subject to project complexity and information quality).

3.4 Conditions and post-installation requirements

CAAF may issue consent with conditions (e.g., mitigations, operational restrictions, construction controls, post-installation verification). If glint/glare or other safety issues are identified after installation, the proponent (in coordination with the aerodrome operator) is responsible for timely mitigation at its cost.

4. ROLES AND RESPONSIBILITIES

4.1 Role of the Solar Project Coordinator

a) Engage early with the aerodrome operator and CAAF before commencing construction;
b) Coordinate the preparation of all required documentation, including a technical glint and glare report;
c) Ensure construction activities and temporary obstacles are managed safely and notified as required; and
d) Implement and fund any required mitigations arising from CAAF's assessment or post-installation monitoring.

Workflow Process for the Solar Project Coordinator

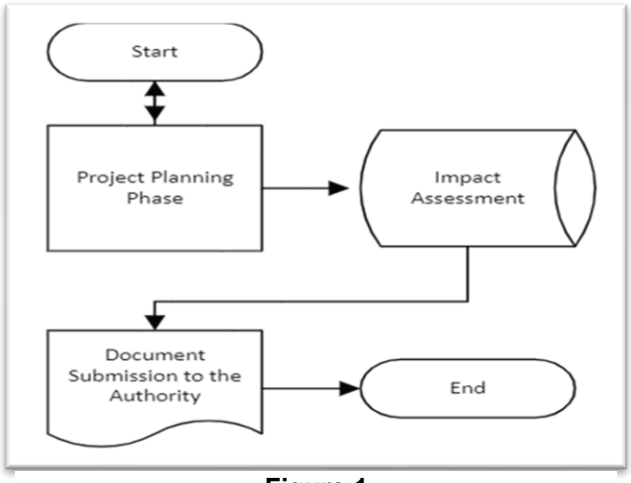

Figure 1

4.2 Roles of the Civil Aviation Authority of Fiji

CAAF's role is to assess whether the proposed installation introduces unacceptable aviation safety risk and to advise whether consent is required and what conditions or mitigations may apply. CAAF may coordinate internally across aerodromes, flight operations, airworthiness, and air navigation disciplines as appropriate.

a) Ensure the project is not located in a Runway Object Free Area, an Obstacle Free one, a Runway Safety Area, a Taxiway Object Free Area, or a Taxiway Safety Area.
b) Ensure project height does not penetrate the imaginary surfaces that define the lower limits of airspace, including the clearway,
c) Ensure that the following information is submitted together with SPV documentation: -
   - Proposed site for SPV installation,
   - Technical glint and glare report
   - Roof Top SPV installation, and
   - Installation in the vertical plane (on plinths or towers)
d) Continually incorporate new information on safety considerations and update this guidance material as appropriate.
e) Conduct an assessment within 20 working days and inform the solar project coordinator of the outcome, and
f) Notify the solar project coordinator in writing when a Safety Assessment is necessary.

Note. — Refer to the Workflow Process in Figure 2

Process for Obtaining Authority's Consent

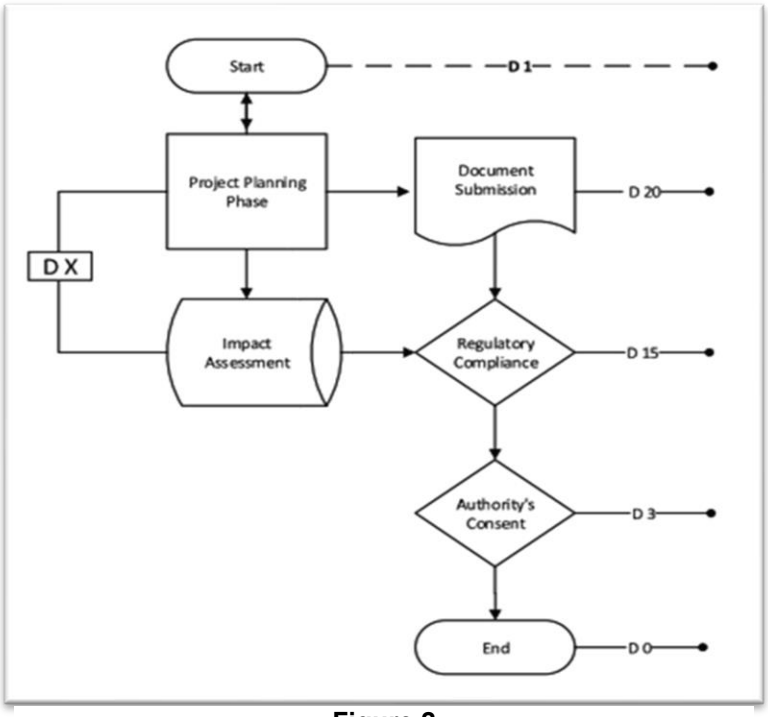

Figure 2

4.3 Role of the Aerodrome Certificate Holder

The Aerodrome Certificate holder plays a crucial role in the installation of solar photovoltaic (PV) systems at or near airports. As such, holders of aerodrome certificates should: -

a) Ensure any on-aerodrome PV installation aligns with the endorsed Aerodrome Master Plan and does not compromise aerodrome certification requirements;
b) Coordinate consultation with affected aircraft operators;
c) Review the proposed location against protected areas and OLS and provide relevant aerodrome safeguarding data (where SPV systems are installed on structures that, for example, extended above the roofline of tall buildings, either on, or 'off-aerodrome', or where they are installed in the vertical plane (on plinths or towers) then there may be the potential for creating an obstacle hazard to aircraft, potential for creating turbulence hazard to aircraft and infringing the aerodrome OLS)
d) Maintain oversight of any mitigation and operational controls on the aerodrome.
e) An Aerodrome Certificate holder is encouraged to validate a glint and glare technical report for the proposed SPV installation site,

Note. — A comparable workflow process, as illustrated in Figure 2 above, is recommended; however, it is important to acknowledge that timelines may vary based on internal procedures

4.4 Role of the Aircraft operators (airlines)

Aircraft operators may be requested to provide operational input (e.g., glare sensitivities on specific procedures) and participate in safety reviews where their operations could be affected.

a) Work closely with airport operators, regulatory bodies, and solar developers to ensure that solar PV projects align with operational needs and safety standards,

b) Provide valuable insights into flight operations, helping to identify potential impacts of solar installations on aircraft operations, such as glare or electromagnetic interference,
c) Participate in safety assessments and reviews to ensure that solar installations do not pose any risks to flight safety. This includes reviewing glare analyses and other safety studies,
d) Support and promote the use of renewable energy as part of their broader sustainability initiatives, and
e) Leverage the installation of solar PV systems as a positive public relations opportunity, showcasing their commitment to environmental sustainability and reducing carbon footprints.

Workflow process for airlines

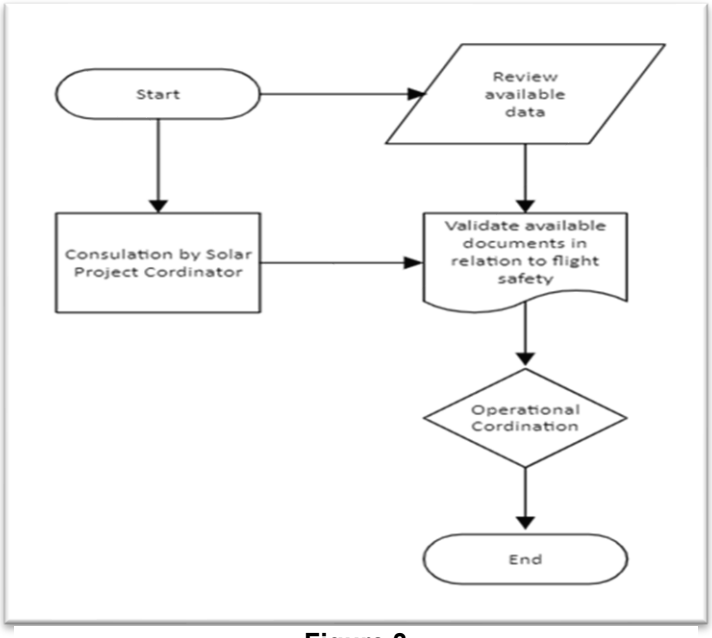

Figure 3

5. Conclusion

This guidance sets out the key requirements and process for installing solar photovoltaic (PV) systems at or near aerodromes, supporting renewable energy development while safeguarding aviation safety. Compliance with CAAF requirements and early engagement with the aerodrome operator and other relevant stakeholders are essential to ensure proposals do not create obstacles, glare, or other operational risks.

CAAF will periodically review and update this guidance to reflect evolving technology and best practice. Through continued coordination and compliance, stakeholders can deliver sustainable energy projects that align with Fiji's climate goals while maintaining public confidence in safe air travel.

Appendix 1: Submission checklist (minimum requirements)

The submission should include (as applicable):

1) Cover letter identifying the developer/proponent, solar project coordinator and contact details;

2) Site plan showing boundaries, coordinates (WGS84), distances to runway/taxiway/apron, and nearby CNS facilities;

3) Layout drawings (plan and elevation) including maximum height above ground level (AGL) and elevation above mean sea level (AMSL);

4) Glint and glare technical report;

5) Electrical design overview and any EMI considerations (where applicable);

6) Construction methodology including cranes/temporary obstacles, work hours, and aerodrome operational impacts;

7) Evidence of consultation with the aerodrome operator and (as applicable) affected aircraft operators;

8) Evidence of other approvals (planning/environmental) where required.

Appendix 2: Inspector assessment checklist (quick reference)

Area	Check	Evidence	Outcome (OK/Issue)	Notes / Actions
Location	Is the site within airport boundary or within airport vicinity (ATZ/8 km)?	Site map + coordinates		
Protected areas	Is the site outside ROFA/RSA/taxiway protected areas (as applicable)?	Aerodrome safeguarding map/statement		
OLS/procedures	Any penetration of OLS or procedure safeguarding surfaces?	Height data + assessment		
Glint/glare	Is a glint and glare report provided and acceptable?	Report + mitigations		
CNS/EMI	Any proximity to CNS facilities requiring additional assessment?	CNS advice / EMI statement		
Construction	Are cranes/temporary obstacles controlled and AIS/NOTAM coordination addressed?	Method statement		
Emergency	Fire safety and emergency access considered?	Fire safety plan / access plan		
Decision	Consent required? Conditions? Safety Assessment needed?	Internal assessment record		

Appendix 3: Developer/Proponent checklist (quick reference)

	Topic			Remarks/Action Required
1.0	**Preliminary Assessment**	**Yes**	**No**	
	• Conduct a site survey to identify potential locations for SPV installation. • Evaluate the impact on airport operations, including flight paths and air traffic control.			
2.0	**Regulatory Compliance**			
	• Obtain necessary permits and approvals from aviation and environmental authorities.			
3.0	**Glare and Reflection Analysis**			
	• Perform a glare analysis to assess the potential impact on pilots and air traffic. • Use approved tools and methodologies to evaluate and mitigate glare risks.			
4.0	**Design and Technology Selection**			
	• Choose appropriate SPV technology and design the system layout to minimize interference with airport operations. • Ensure the design complies with all relevant safety and performance standards.			
5.0	**Financial and Environmental Assessment**			
	• Conduct a financial analysis to determine the project's economic feasibility. • Evaluate the environmental impact and benefits of the SPV installation.			
6.0	**Developer and Supplier Selection**			
	• Select experienced developers and suppliers with a proven track record in airport solar installations. • Ensure contracts include performance guarantees and maintenance agreements.			
7.0	**Construction Planning**			

	• Plan construction activities to minimize disruption to airport operations. • Implement safety measures to protect workers and airport users during construction. • Coordinate with AIS Office on the planned construction timelines.			
8.0	**Installation and Integration**			
	• Install the S PV system according to the approved design and safety standards. • Ensure proper integration with the airport's electrical infrastructure.			
9.0	**Commissioning and Testing**			
	• Conduct thorough testing of the solar PV system before commissioning. • Verify that the system meets all design specifications and performance criteria.			
10.0	**Operation and Maintenance**			
	• Develop a maintenance plan to ensure the long-term performance of the solar PV system. • Schedule regular inspections and cleaning of solar panels. • Monitor system performance and address any issues promptly.			
11.0	**End of Life Considerations**			
	• Plan for the eventual decommissioning and disposal of solar panels. • Explore recycling options for solar panel materials.			
12.0	**Documentation and Reporting**			
	• Maintain detailed records of all assessments, approvals, and maintenance activities. • Report any incidents or issues to the relevant aviation authority.			

Appendix 4 : Useful Resources

Stakeholders may find the following resources useful:

1. **ACI** – Airport Solar PV Implementation Guidance Document for Asia-Pacific & Middle East Airports. Retrieved from https://www.aciasiapac.aero/f/library/4552/Solar%20Energy%20for%20Airports%Draft%20Final.pdf

2. **FAA** – https://www.federalregister.gov/documents/2021/05/11/2021-09862/federal-aviation-administration-policy-review-of-solar-energy-system-projects-on-federally-obligated

3. Global Solar Atlas

4. (2018, December 5). **Position Paper - Solar Panel Installations at Airports.** Retrieved from https://www.ifalpa.org/publications/library/solar-panel-installations-at-airports--2744

5. **Solar GIS** – Solargis Prospect

6. M.H. Banda *et al.*
Performance evaluation of 830 kWp grid-connected photovoltaic power plant at Kamuzu International Airport – Malawi
https://www.sciencedirect.com/science/article/pii/S097308261831319X
Ener. Sustain. Dev. (2019)

7. (2019). **A focus on the production of renewable energy at the airport site**. ICAO
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