SANAD PV Design Review Report

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Project Summary

Field	Value
Site	Jeddah, Mecca Region, Saudi Arabia
Coordinates	21.49012, 39.18624
Design Tmin (°C)	14.9
Inverter (BoM)	Inverter model not specified

BoM Signals Used

Signal	Value
Voc_STC per module (V)	49.5
Voc temp coeff (/°C)	-0.0029
Modules per string	22
Inverter DC max (V)	1100.0

BoM ↔ SLD Consistency

Status: **WARN**

- ■ Inverter DC max voltage not detected in SLD
- ■ Modules per string not detected in SLD

Winter Overvoltage Risk

Status: **FAIL**

- String Voc at 14.9°C = 1120.9 V
- Inverter DC max = 1100 V
- ✗ OVERVOLTAGE RISK: exceeds limit by 20.9 V

Calculation values

Parameter	Value
Voc_STC (V)	49.50
Temp coeff (/°C)	-0.0029
Design Tmin (°C)	14.9
Delta T (°C)	-10.1
Voc_cold per module (V)	50.95

Modules per string	22
String Voc_cold (V)	1120.9
Inverter DC max (V)	1100
Margin (V)	-20.9
Margin (%)	-1.9%

Recommendations

• Reduce modules per string from 22 to 21

• Verify module datasheet Voc and temperature coefficient

• Consider inverter with higher DC voltage rating

AC Voltage Drop

Metric	Value
Max inverter VD%	2.74% (limit 3.00%)
Max combiner→MDB VD%	1.09% (limit 1.50%)
Inverter runs	17
Combiner runs	3

Result: **PASS** — within limits.

Compliance Snapshot

Compliant points

• Module Voc temperature coefficient considered

• Site-specific historical Tmin used for analysis

Gaps / actions

• String Voc at Tmin may exceed inverter DC max

• BoM and SLD show discrepancies — verify design intent

• DC cable sizing verification not yet implemented

• Grounding coordination requires manual review