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ESMAP
Energy Sector Management Assistance Program

Solar Resource Mapping in Pakistan

MAINTENANCE VISIT REPORKI-HJCK8 I K#)+Ů

August 2016

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This document is an **interim output** from the above-mentioned project. Users are strongly advised to exercise caution when utilizing the information and data contained, as this has not been subject to full peer review. The final, validated, peer reviewed output from this project will be the Pakistan Solar Atlas, which will be published once the project is completed.

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CSPS Technical Documentation

ESMAP Tier2 Meteorological Station Maintenance Report: M. Nawaz Sharif University of Engineering and Technology, Multan, Pakistan

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Summary

Site	
Site:	M. Nawaz Sharif University of Enigneering and Technology, Multan
Coordinates:	30.165°N, 71.498°E
Station Type:	ESMAP Tier 2 Station
Date of installation:	2014-10-20 to 21
Date of maintenance visit:	2015-11-18
Serial Numbers	
Station SN#:	CSPS.MT.14.215
Control Box SN#:	CSPS.CA.14.209.0001
RSI SN# – Drive, PU:	DR.14.0001.0012, MS.14.001.0012
GHI CMP SN#:	140568
Inspection visit staff	
Inspection performed by (Date, Names and Signatures) Date: 03 February 2016	 Muhammad Umer Kamal, PITCO

The CSP Services (CSPS) ESMAP Project Tier1 meteorological station CSPS.MT.14.215, operational since Oct. 21st 2015, was inspected and tested for its correct operation by PITCO staff on Nov. 18, 2015.

The station is fully functional. The irradiation sensors showed no significant increase in their irradiation signal upon cleaning of the sensor head.

It is recommended to clean the sensors on a weekly basis in order to reduce the influence of sensor soiling on the irradiance data.

Completed Tasks

- Foundations checked for integrity.
- All parts and sensors of the station examined for damage, dust or condensed humidity, current status recorded and equipment cleaned where necessary.
- Vertical alignment of wind mast checked, wind mast anchorage and wind mast guying ropes checked for stability, secure fixation to the ground and tightness.
- Rotating Shadowband Pyranometer (RSI) and CMP10 pyranometer alignment adjusted and fine-tuned, no perceptible influence on the irradiance data stated.
- Solar irradiation sensors checked for proper operation and functionality; sensors cleaned, impact of cleaning on data recorded.
- Batteries Box and solar panel inspected and correct operation of 12 VDC circuit verified.
- Mounting structure stability checked.
- Datalogger program correct operation verified.
- Measured quantities checked for proper operation and correct values.
- Cleaning inspection button checked for proper functioning.
- Fuses, electrical components and wiring checked.

Pending Tasks / Recommended Tasks for next Maintenance Visit

None

Maintenance Checklist

Component	Work item	Checked/ approved		Comments
		yes	no	
Foundations, fence	Foundations and anchors intact	X		
	Fence and door intact	X		Fence and door at entry stairs to roof
	Lock on door intact and usable	X		
Support structure with control box	Firmly installed	X		
	Grounding cable connected	X		
	All bolts tightened	X		
Wiring, cables	Visual examination	X		
	Fuses ok	X		
	PV Power cable connected	X		
	Electrical connection	X		
Power Supply	PV Panel(s) visual examination	X		Cleaned
	Supply Voltage	X		
	Batteries ok and charging	X		

Component	Work item	Checked/ approved		Comments
		yes	no	
Barometric Pressure Sensor	Sensor Serial No.	X		Model: Setra 278 SN#:5948999
	Visual examination, operability	X		
T_{amb} / RH	Irradiation shield visual examination	X		
	Sensor probe and chip examination	X		
	Filter cap examination	X		Cleaned
	Sensor Serial No.	X		Model: CS215 SN#: E12266
RSI	Visual examination, operability	X		Dirty on diffuser disc, cleaned
	Drive Unit	X		SN: DR.14.001.0012
	PU Unit	X		SN: MS.14.001.0012
	Diffuser disc / LI-COR sensor(s)	X		
	Shadow band	X		
	Horizontal leveling	X		Slightly adjusted
Thermopile Irradiation Sensor Alignment	Pyranometer GHI	X		SN# : 140568, cleaned
	Horizontal leveling	X		Slightly adjusted
Wind tower, wind speed and direc-tion sensors	Visual examination, alignment	X		
	Wind direction sensor serial No.	X		Model: NRG#200 SN#: N/A
	Wind speed sensor serial No.	X		Model: NRG#40C SN#: 1795-00229365
	North Orientation of WD sensor	X		
	Operability of sensors	X		
Modem	SIM card	X		Provider / number: Telenor
	APN, username, password of SIM	X		APN: internet Username: Telenor Password: Telenor
	LED blinking code	X		
Datalogger	Operation system installed	X		Version: Std.27
	Datalogger configuration saved	X		File name: Pk-Mul_2014-10-20.xml
	IP visible in logger configuration	X		IP: dynamic
	Correct sensor constants in program	X		
	Correct coordinates in program	X		
	Datalogger program installed	X		Program name: Pk-Mul-2014-10-20.CR1 Subroutines: ESMAP-Pakistan-MDI-Su-broutines-2014-08-19_str_Enc.CR1
	Program set to “Run always”	X		
	Datalogger clock correct	X		Local standard time, no daylight saving time: UTC+5 Logger time shift detected: 0 s

Photographic documentation

Figure 1: MDI stand with PV panel and sensor mounts (back side, from South)

Figure 2: CMP10 with level

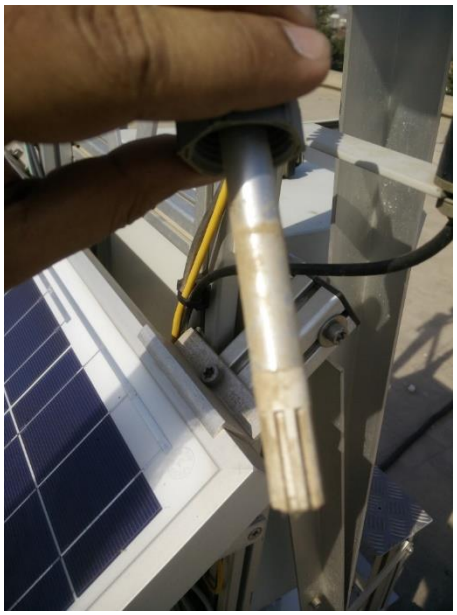

Figure 3: Temperature sensor before cleaning

Figure 4: Fence at access stairs

Figure 5: RSI Pyranometer unit

Figure 6: RSI Pyranometer unit with water level

Figure 7: Wind tower foot

Figure 8: Wind tower

Figure 9: Station overview (view from West)