



PURCHASE SPECIFICATION, GROUP: PHOTOVOLTAICS
SUPPLY AND I&C OF FIRE ALARM SYSTEM IN 129MW SOLAR PV
PLANTS, TELANGANA

PS-439-1279

REV NO: 01

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TECHNICAL SPECIFICATION

FOR

SUPPLY, INSTALLATION & COMMISSIONING OF FIRE ALARM SYSTEM

IN 129MW SOLAR PV PLANTS, TELANGANA

Revision details :

- i. Changes are **highlighted in color**
- ii. Drawings revised

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1.0 INTRODUCTION:

This technical specification provides BHEL's requirement for supply, installation and commissioning of Fire Alarm System in 129 MW Solar Photovoltaic (SPV) power plants for M/s SCCL at Telangana consisting of four sites as below-

- 50MW Ramagundam Solar project (1 no of Control room, 9 nos of inverter room)
- 39MW Yellandu Solar project (1 no of Control room, 7 nos of inverter room)
- 30MW Manuguru Solar project (1 no of Control room, 5 nos of inverter room)
- 10MW STPP, Pegadapally Solar project (1 no of Control room, 1 no of inverter room)

Independent / Stand Alone Fire alarm systems shall be installed in Main Control room (RCC building) and Inverter rooms (RCC buildings). These Fire alarm systems of each room shall be connected to SCADA panels at respective rooms via RS-485 Modbus protocol. There will be no cabling requirement between rooms.

2.0 SCOPE OF SUPPLY AND INSTALLATION:

Sl.	Item Description	Quantity
1	Supply of Fire Alarm system for Control Room	As per tender requirement
2	Supply of Fire Alarm system for Inverter Room	As per tender requirement
3	Installation and Commissioning of Fire Alarm system for Control Room	As per tender requirement
4	Installation and Commissioning of Fire Alarm system for Inverter Room	As per tender requirement

3.0 ENCLOSURES TO THIS TENDER SPECIFICATION (TENDER PURPOSE ONLY)

1	Tentative Fire alarm system layout with BoM of Main Control Room for all four sites
2	Tentative Fire alarm system layout with BoM of Inverter Room for all four sites

Note: The Fire alarm system layouts enclosed are indicative and are prepared considering radius of coverage of each detector as per IS 2189. In case, vendor proposes detectors with different coverage area, vendor shall submit revised layout and consider number of detectors accordingly in offer.

4.0 TECHNICAL DETAILS:

1.0 Standards and Codes

Standard/Code	Description
IS 2189	Selection, Installation and Maintenance of Automatic Fire Detection and Alarm System Code of Practice, latest edition
National Building code 2005	

Fire Alarm system at each room shall consist of following components:

1.1 Fire Alarm Panel: Microprocessor based Integrated Fire Detection, Alarm and Control System of UL or VdS listed with Microprocessor based networkable analogue addressable Main Fire Alarm Control having loop capacity of minimum one loop, each loop having capacity of minimum 99 addressable detectors and 99 addressable devices. Panel capacity can be expanded to additional loops by addition of modules or integrating multiple panels. Panel shall contain power supply, 24VDC power supply automatic battery charger, 24 volts sealed lead acid batteries sufficient for 24 hours normal

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working and then be capable of operating the system for 2 hours during emergency conditions. The system should be complete with user-friendly programming and configuration tools, front panel operating LCD display. The Panel as well as detectors and devices shall be UL or VdS Listed and in conformance with IS 2189. **One number of fault isolator shall be provided in the fire alarm panel.** The complete system as a solution must be supplied from the same make/OEM manufacturer components conforming to these standards. The panel shall have the capability to integrate with SCADA on open protocol (MODBUS) and shall be addressable & communicable with SCADA. Necessary MODBUS converter module shall be provided in the panel. **Fire alarm panel communication to SCADA shall be through Cat 6 cable only.** Provision for displaying Alarms in SCADA shall be available.

1.2 Multi Sensor Smoke Detector: Analog Addressable Multi-Criteria Sensing Type Smoke Detectors as per application must be with mounting based LED, Address Switch inclusive of detector base and complete as required. All Detectors must be UL or VdS Listed.

1.3 Hooter cum Strobe: UL or VdS Listed Directional Hooters, Lighting strobe also to be provided.

1.4 Manual Call Point / Glass Break Device: UL or VdS listed, Flush or surface mounted Manual Call Point in manufacturers prescribed matching red enamel outlet box complete. All components must be of same manufacturing origin.

1.5 Monitor, Control Modules & Fault Isolators: UL or VdS listed, modules complete with mounting arrangement on North American junction box as per IS 2189.

1.6 Cables and conduits: All Cables required for operation of Fire alarm system shall be supplied and installed by vendor. This includes cable from Building auxiliary distribution panel to Fire alarm panel (**minimum size 3CX1.5sqmm Copper cable**), cable between Fire alarm panel and detectors, manual call points, Hooter, Strobe and **cable between Fire alarm panel to SCADA (Cat 6 cable)** etc. Specification of cable shall be as per relevant standards and as per recommendations of manufacturers. Details of Cables used for Fire system shall be indicated in layout. Cables shall be of armoured type. PVC conduits required for laying of cables shall also be supplied by vendor.

1.7 Installation requirements: The installation practices adopted for fire detection and alarm system shall comply with relevant standards. **Cabling shall be as per Class A wiring scheme.** Cabling shall be concealed in PVC conduits for aesthetic view. All lugs, glands, clamps, fixing arrangements, hardware, tools and tackles shall be arranged by vendor.

1.8 Commissioning: After completion of installation, vendor shall commission the system and demonstrate the operation of complete system **including SCADA connectivity** to BHEL/ Customer representatives at site.

1.9 Spares: As per BoM in drawing for Fire alarm layout in Control Room. Supply of spares will be covered under line item 1 (Supply of Fire Alarm system for Control Room).

5.0 Documents to be submitted along with offer

1. Vendor shall confirm NIL deviation to BHEL specification.
2. Type certificates of fire Alarm system