Technical Specifications Compliance Sheets For Fire Alarm System

INTRODUCTION

This specification covers the requirements of Fire detection & alarm system to be provided for **Amorphous Silicon Solar Cell Plant "BHEL GURGAON"** The proposed fire detection & alarm system shall be designed to provide adequate safety measures in the areas susceptible to fire in compliance with the recommendations of the Tariff Advisory Committee (TAC) / National fire protection association (NFPA) codes. The system design and installation shall be got approved from TAC-India / TAC accredited professionals by the bidder to enable customer to obtain maximum applicable rebate on insurance premium. Any equipment / item not specifically mentioned in the technical specification but are found necessary to meet the requirements of T.A.C. and are required for safe and sound operation of the system shall also be included in scope of supply.

Sl. No.	Description of Specifications	Compliance Yes / No
01	**GENERAL** All the system components of fire detection & alarm system shall have the approval / listing from any one of the followings international test laboratory: UL – USA / LPCB –UK / FM – USA / Vds - GERMANY	
02	**SYSTEM DESCRIPTION AND TECHNICAL FEATURES** **Fire detection and alarm system** The fire detection and alarm system shall consist of a centralized microprocessor based analogue addressable type system with a computerized central monitoring station to be located in the security gate house with followings: • Analogue addressable fire alarm panels • Master system CPU with HDD, FDD, HD Memory (40GB Minimum), RAM-256MB, Optical mouse and keyboard. • Pentium based monitoring station with Colour Graphic display (Colour monitor shall be of 21 inch size). • Printer (Laser printer to print A4 size sheets). • Power supplies including UPS, batteries and battery chargers. • Analogue addressable smoke/ heat detectors. • Software and hardware as required for operation of system • Cabling. • I/O modules as required	
03	**The locations of various fire alarm panels /repeater panels to be provided by bidder shall be as under: -** • Main fire alarm panel with work station i.e. PC, VDU and Printer in security gate house. • Local fire alarm panel in administrative building	

04	**Areas to be covered under Fire detection and alarm System** **Mutisensor type detector (Below the ceiling or below the false ceiling as the case may be)** • Process blocks ground & first floor. • Service building. • Canteen building. • Security complex • Inflammable stores. • Administrative blocks ground and first floors. • BIPV building – ground and first floors	
	Fire detection & alarm system specific technical features/requirements • The microprocessor based analogue addressable fire alarm panel to be located at security gate house shall serve as master panel and shall receive signal from sensors installed at various areas.. • The central monitoring station to be provided at security gate house shall cover the fire detection and protection system of the complete areas as defined against clause no. 3.2.0. This shall give alarm of fire/fault condition of each of the risk area. Further this shall activate a hooter/sounder in each of the area provided with fire detection system. • Provision of necessary potential free contacts in main fire alarm panel shall be made for tripping of air conditioning and ventilation systems of areas under fire. • All the circuits from the detectors to fire alarm panels shall be closed loop type and shall be supervised for open and short-circuiting. The trouble signal shall also be annunciated in the respective panels. • Sensitivity adjustment of detectors shall be possible from detectors and fire alarm panels as well. • Each loop element such as addressable detectors, relay modules, monitor modules etc. shall have inbuilt short circuit isolator. Also the addressable loop elements/detectors shall have feature of electronic addressing automatically. • Complete fire detection & alarm system shall be suitable of working on 24 V DC supply. Arrangement of conversion of main AC supply to DC supply shall be possible through a dedicated rectifier bank within each fire alarm panel. Each fire panel shall be provided with Battery and Battery charger with provision for automatic change over from mains to battery, automatic charging etc. • Capacity of each set of battery shall be sufficient for 72 hours system operation under normal condition and for 2 hours under alarm condition. • The Batteries shall be of maintenance free sealed lead acid type. • The detector cable and other control cable shall be armored, screened and twisted FRLS type. • The design coverage area for multisensory type detectors shall not exceed 25 Sq.m. • All the associated equipments with analogue addressable microprocessor based fire detection and alarm shall be approved and listed by any one of following international testing laboratory (UL/FM/LPCB/VdS). • Multisensor detectors shall be of intelligent analogue addressable type. • The wiring of the all areas shall be of class A (2-wire) type so that in the event of open/short circuiting of the cables, the detection	

	system is not jeopardized at any instant. • The software logic modules and system database shall be programmable using a MS - Windows compatible program on Pentium PC at site and required hardware shall be provided. The system software programmed shall be password protected and shall include full upload and download capability and during program upload or download through the PC, the capability of alarm reporting shall be retained. The software shall be downloaded to a PC for editing. The software shall enable purchaser to add the spare loop provided in the fire alarm panels or addition of devices/detectors in any of the fire alarm panel. • The system shall support the use of Color Graphic display terminal for the display of information in an appropriate format. • System configuration shall be menu driven and capable of being operated by, a person with no previous computer programming experience. • The detectors shall be self-compensating for ambient temperature and humidity. • The detectors shall display a steady LED when in the normal state. The LED shall flash in alarm mode. • Each fire alarm panel shall be provided with one spare loop complete with loop cards and all other accessories so that the system can be expanded in future by purchaser. Further at least 10% of loop capacity shall be left free in each of the connected loop in all the panels, so that, additional devices may be connected to the system in any of the loop by purchaser in future.	
	Equipments and services to be provided by bidder (separate table given below)	
	Equipments and services to be provided by purchaser (BHEL) • Supply and laying of power cables for 240V, 1-Ph, 50Hz power supply to various fire alarm panel. Termination of cables at purchaser's supplied equipment end shall be by purchaser and at vendor's supplied equipments shall be by vendor. • UPS grade power supply to PC, VDU and Printer at various places. • Provision of space for mounting or placement fire alarm panels in security gate room and administrative building. • Necessary cable trays in cable trenches for laying control cables & necessary cable racks for laying above ground cables, wherever required. • Termination of control cables from local control panels (within pump house) to fire fighting MCC for interlocking purpose. Termination at Vendor supplied equipment including lugs and glands shall be done by Vendor only. • Fire retardant sealings for all openings/ penetrations for cables/ cable trays/ cable trenches. • Coating of fire retardant paint on all control cables. • Lighting of all buildings.	
	• Supply, laying and termination of FRLS power, control cables required for complete fire detection & alarm system. • Necessary cable glands/lugs/connectors/clips/conduits etc. for laying and termination of control cables .	

Equipments and services to be provided by bidder

The equipments and services to be provided by bidder under this contract are detailed herein for reference. Any item though not specifically mentioned but required for safe and satisfactory operation of system and for any modification or changes for taking care of TAC/accredited agency approval of system shall be treated as included and shall be supplied within the quoted price and no extra shall be admissible on such account unless otherwise specified clearly in the bid offer.

SR.NO	FIRE DETECTION AND ALARM SYSTEM - BILL OF QUANTITY	UNIT	QTY	Compliance Yes / No
1.0	Multi-sensor type detectors	Nos.	152	
2.0	Addressable Manual Call Points	Nos.	25	
3.0	Response Indicators	Nos.	50	
4.0	Electronic Hooters	Nos.	37	
5.0	Microprocessor based Master fire alarm panel with its own battery and battery charger to be located in security gate room	Nos.	01	
6.0	PC, VDU & Printer (workstation) for master Fire Alarm Panel in Security gate room	Sets	01	
7.0	Repeater Panel - Microprocessor based (Local Fire Station) to be located in Administrative building	No.	01	
8.0	Control Cables - 1.1 KV Grade to IS: 1554, Overall FRLS Sheath, Screened Armoured & twisted Size: 2C x 1.5 mm 2	mt	3500	
9.0	Relay Module	Set	01	
10.0	Control module (for tripping ACs, AHUs, starting of back-up DG for Jockey Pump)	set	01	
11.0	Monitor module as per system requirement	set	01	
12.0	Power Cables between main Fire Alarm Panel at Security Gate & repeater panel at Administration Block (2C x 2.5 mm2 – FRLS Type)	mt	150	
13.0	Fault Isolator	Set	01	

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