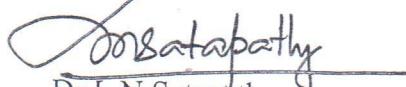


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SL NO	SPECIFICATION	REQUIREMENT
1	Purpose	The system should be capable of determining the level control of ceramic slip in a tank using non contact technology
2	Scope of Supply	Complete Level Control system as outlined in clause 11 of this specification. The Vendor must ensure that the system being offered is a new one and not refurbished or repaired one. If any of the system supplied by the Vendor is found to be substandard, refurbished or not in accordance with the description /specification or otherwise faulty, the purchaser will have the right to reject the equipment or its part
3	Qualifying Requirement:	Manufacturer / Principals of Original manufacturer should have supplied at least ONE similar systems or use in similar usage in industries / Institutions in India and certificate from user to demonstrate satisfactory operation of equipment for at least one year is essential. In case of agent for overseas manufacturer, a letter of authorization from the manufacturer should be submitted along with the offer.
4	Warranty and Service	One year warranty from the date of completion of installation. All spares supplied for maintenance during warranty period should be free of cost.
5	Utilities Requirement	Various utilities such as power connection, computer connectivity etc. are to be provided by BHEL separately. However, technical requirement of these utilities are to be furnished by the vendor.
6	Safety features	System to be provided with suitable Safety arrangements .
7	Standard sample	Standard samples (if any) for calibration of the Level Control system will be inclusive in the offer.
8	Availability of Spares	The Vendor must assure the availability of spares for servicing of system for at least 10 years. Supplier should give an undertaking that spare parts will be supplied within the specified periods as and when ordered.
9	Installation and Training	The system will be installed by the supplier at BHEL Malleswaram complex, Bangalore, India. ONE day training should be provided free of charge at the premises of BHEL, Malleswaram Complex , BANGALORE on operation and maintenance of the system.
10	Descriptive literature and User & Service Manuals	A set of specifications, description and illustrated literature of the system, electrical circuit diagram and related peripherals should accompany the Techno-Commercial bid. A set of User's manuals and Service manuals of the main instrument, attachments and related equipment should be supplied with the system

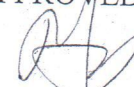
PREPARED BY



Dr L N Satapathy

Sr. DY. General MANAGER/CTI

APPROVED BY



Dr. R N Das

AGM & Head /CTI

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11. Technical Specifications for Ultrasonic Level Control System

Application :

To measure online ceramic slip level in a tank of 28 m³ capacity(Sketch enclosed- required for BT-17 and BT-18). The ceramic slip consists of ceramic powder dispersed in water in 1:1 ratio with specific gravity in the range of 1.40 ± 0.02 g/cc. Three different ceramic slips from three different sources will be added to the main tank at a particular ratio. The non contact level controller has to accurately measure the level of each slip with cut off relay in the presence of a permanent paddle moving in the tank for maintaining dispersion. Maintaining the level of each slip is very crucial for achieving the properties of final product.

The level controller system has the following parts :

1. Ultra-sonic level Transmitter – 03 Nos.
2. Multi channel Intelligent data Logger with mounting in panel box – 01 Nos.
3. RS 485 to USB converter mounted in panel box - 01 Nos.
4. Software for control and batch tracking - 01 Nos.

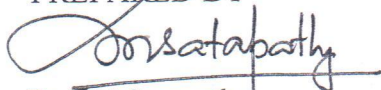
Detailed specifications for Ultrasonic Level Transmitter and Multi channel Intelligent Data Logger are given below.

Ultrasonic Level Transmitter

1. Range : 0.2 to 8 m
2. Frequency : 75 kHz
3. Transducer type : PVDF
4. Supply : 18-33 V DC
5. Output : 4-20 mA with provision for error settings
6. Built in and external temperature sensor
7. Temperature range : -30 to 70 °C
8. **Accuracy in height measurement** : ± 0.25 % minimum in entire range
9. Display : Graphic LCD
10. Process tracking rate : 10 m per minute
11. Housing : PC/Abs, IP 68 compatible
12. Process connection : 1.5 inch BSP M
13. The Transmitter should be capable of BLOCKING OUT the PADDLE inside tank disturbing the continuous measurement

14. Number of Transmitters Required : THREE

PREPARED BY



Dr L N Satapathy

Sr. DY. General MANAGER/CTI

APPROVED BY



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AGM & Head /CTI

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Multi channel Intelligent data Logger

1. Advanced microcontroller based signal processing : To accept 8 analog channels, 8 digital inputs, 8 relay outputs and a RS 485 interface.
2. Display : 16 character, 2 line alpha numeric LCD backlit
3. Front Keypad programming
4. 18-30 V DC supply
5. I/P : 4-20 mA/ 0-5 V DC/ 0-10 V DC
6. Input and Output : 8 I/P channels and 4 Programmable relay output
7. RS 485 communication (MODBUS) compatible
8. MS powder coated Panel box for mounting Data Logger with necessary accessories
9. Accuracy : $\pm 0.1 \%$
10. Option for Manual control to be provided

RS 485 to USB converter

1. RS 485 MODBUS communication
2. MS Powder coated panel box for Mounting RS 485 to USB converter

Software for Control and batch tracking

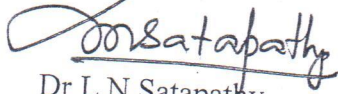
The software will have the following features:

1. Log of all batches run – Date/Time of completion, Amount of each slip added for the batch, total product quantity etc.
2. Enable the Operator to take daily, weekly. Monthly and yearly production reports
3. Compatible with MS office system

Note :

Visit to the site can be planned (if required) to understand the system requirement prior to quote.

PREPARED BY



Dr L N Satapathy

Sr. DY. General MANAGER/CTI

APPROVED BY

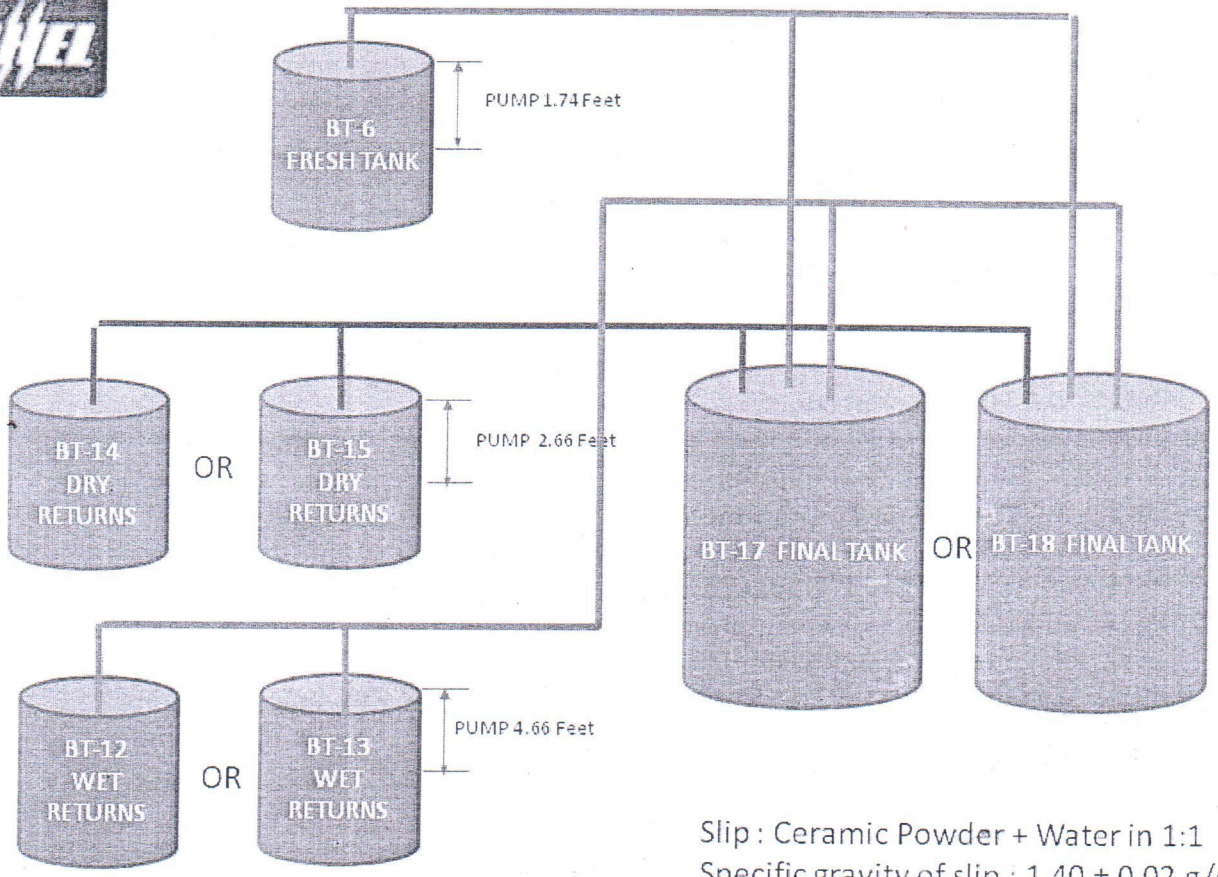


Dr. R N Das

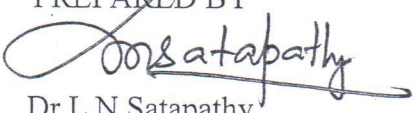

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Slip : Ceramic Powder + Water in 1:1
Specific gravity of slip : 1.40 ± 0.02 g/cc

<p>PREPARED BY  Dr L N Satapathy Sr. DY. General MANAGER/CTI</p>	<p>APPROVED BY  Dr. R N Das AGM & Head /CTI</p>
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