UNFCCC Secretariat
Martin-Luther-King-Strasse 8
D-53153 Bonn
Germany

Att: CDM Executive Board

DET NORSKE VERITAS
CERTIFICATION AS
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NO 945 748 931 MVA

Your ref.:	Our ref.:	Date:
CDM Ref 0098	MLEH/KCHA	19 October 2007

Response to requests to review
4.5 MW Maujhi Grid-connected SHP in Himachal Pradesh, India (0098)

Dear Members of the CDM Executive Board,

We refer to the issues raised by the requests for review by three Board members regarding our request of issuance of CERs for project activity 0098 "4.5 MW Maujhi Grid-connected SHP in Himachal Pradesh, India" and would like to provide our initial response to issues raised.

Comment 1:
The DOE shall clarify how they have verified calibration procedures as the verification report contains inconsistent statement regarding the frequency of calibration of the meters: "the calibration of the electricity meters is being done regularly every six months and have been verified by DNV" (page 4) and "calibration process is followed as per defined procedures and carried out annually and the calibration certificates of the instruments used for data monitoring and recording were also verified during the site visit" (page 5).

DNV Response
As per the established quality control procedures by the project proponent, all the energy meters are required to be *calibrated and sealed as per the industry practices at regular intervals.* This has also been addressed in the registered PDD. DNV's interpretation of *industry practices* and *regular intervals* has been the stipulations in the power purchase agreement the project proponent has entered into with the Himachal Pradesh State Electricity Board (HPSEB), the state owned utility company to whose grid the generated electricity is being exported to. The power purchase agreement stipulates that the frequency of calibration shall be once in six months (section 7.5 of the PPA attached as Annexure 1). Hence, DNV confirms that the project proponent has followed a calibration frequency of six months and all records to this extent have been presented and verified to be appropriate. The periodic calibrations have been carried out by the Maintenance and Test Division of the HPSEB. Details of the calibrations done and a few sample records have been presented as Annexure 2.

We regret the error in indicating a yearly frequency in the verification report and thank the Board for bringing this to the notice of DNV.

Comment 2:
The PP shall clarify whether they have maintained and calibrated energy meters as per the Monitoring Plan or only "according to procedures laid out in the PPA" as stated in the monitoring Report (page 2 of 5)

DNV Response
DNV reiterates that the maintenance and calibration of the energy meters are in line with the monitoring plan and in accordance with the laid out procedures as per the PPA (as detailed in our response to comment no.1)

Comment 3:
The DOE shall clarify how they have verified that "All the data required for emission reduction calculations [that] are manually recorded in log sheets every month" are "then transferred to a spreadsheet and the actual values for the month are then taken for emission reduction calculations."

DNV Response
We hereby confirm to have verified the following records at the site, maintained by the project proponent.

- Shift wise log books recording daily generation and export data with all operating parameters.
- Daily production report maintained by plant manager
- Consolidated monthly report including summary of generation, maintenance details etc
- Duly signed joint meter reading certificates.

As per the monitoring plan in the registered PDD, the data will be recorded both at the project site as well as at the grid substation, which is under the control of HPSEB. The energy measured using calibrated meters and recorded at the HPSEB substation will be monitored. Records of measurements will be used for verification of emissions reductions.The data recorded in the duly signed joint meter reading certificates have been transposed into the excel sheet and used for reporting the emission reduction calculations. This excel spreadsheet has been uploaded during the request for issuance. We reiterate the process of checking the records are in line with what has been stipulated in the registered PDD.

Comment 4:
The DOE shall clarify how they have verified that the calibration has been done by an entity with the appropriate competencies and qualifications.

DNV Response
Kindly refer to our response under comment no.1. We reiterate that the calibration has been carried out by the maintenance and test division of the HPSEB, which is a utility owned by the state government of Himachal Pradesh. HPSEB is thus deemed to be a competent authority. In India, all energy meter calibrations are carried out by the respective state owned power utility companies such as the HPSEB.

Comment 5:
The PP shall further clarify their reference to uncertainty of results in the monitoring Report (page 5 of 5)

DNV Response
The uncertainty of the results in the monitoring report is restricted to only the energy readings that are either exported or imported from the grid. The resolution of uncertainties, if any are as addressed in the PPA (attached as Annexure 1).

Comment 6:
The PP shall further clarify if the Joint Meter Reading was actually verified or will be only verified in next monitoring periods as stated in page 5 of 5 of their monitoring Report.

DNV Response
DNV confirms that joint readings have been verified.

We sincerely hope that the Board finds our elaboration on the above satisfactory and look forward to the issuance of CERs for this project activity.

Yours faithfully
for DET NORSKE VERITAS CERTIFICATION AS

Kumaraswamt Chandrashekara
Manager-Climate Change Services

Michael Lehmann
Technical Director
Iternational Climate Change Services

Annexure 1

ARTICLE 7

METERING STANDARDS AND TESTING

7.1 The Project Line(s) shall be constructed, operated and maintained by the Company as a part of the Project for evacuating power from the Project. The construction, operation and maintenance of the Interconnection Facilities shall be done by the Board at the cost of the Company for which a separate agreement will be entered into by the Company with the Board in accordance with Section 3.3.

For measuring the delivery/import of Energy by the Company at the Interconnection Point, one set of Main Meter (part of Interconnection Facilities) and Check Meter shall be provided by the Company and the Board respectively at the Interconnection Point. The general location of the metering equipment shall be communicated by the Company to the Board at least ninety (90) days prior to the Commercial Operation Date of the Project.

7.2 Main and Check Meter as per Section 7.1 above shall be capable of measuring and recording the following parameters for various time/frequency blocks as per Prudent Utility Practices :-

i) Active Energy (kWh) and Reactive Energy (kVarh);
ii) instantaneous voltage, current and power factor;
iii) frequency;
iv) maximum demand in kVA/kW for each Demand Period and for the total period since last reset;
v) kWh/kVarh since last reading;
vi) real time and time of day metering; and
vii) number of resets.

Meters will have facilities for reset. The metering system shall be independent of phase sequence reversal, C.T. polarity reversal and shall also give an indication in case of missing P.T. potential. The metering system shall also be capable to record export and import data separately. Accuracy class for Active Energy measurement shall be 0.5 as defined in applicable IEC/Indian standards. For all other values, the accuracy class shall be as per Prudent Utility Practices.

7.3 The copies of certified results of the factory calibration tests for the Main Meter and the Check Meter conducted in accordance with Prudent Utility Practices shall be provided by each concerned Party to the other Party. The Company as well as the Board shall keep requisite sets of metering equipment, duly tested/calibrated, as spares, for replacement as and when required. Main Meter or Check Meter shall be replaced by spare set of meter with mutual consent of the Parties whenever the Main Meter or the Check Meter is required to be removed.

Meter installed after replacement shall be treated as Main Meter or Check Meter, as the case may be.

7.4 The Main Meter and the Check Meter shall be maintained in accordance with Prudent Utility Practices. The meters installed at the Interconnection Point shall be jointly inspected and sealed on behalf of the Parties and shall not be interfered with by either Party except in the presence of the other Party or its accredited representative(s).

7.5 a) The Main Meter and Check Meter shall be test checked for accuracy insitu at least fifteen (15) days before commercialisation of the first Unit and every six months

H.P. ELECTRICITY REGULATORY COMMISSION SHIMLA

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Secretary

thereafter. The test for the main meter and the check meter shall be done with reference to a portable Sub Standard meter, which shall be of accuracy class compatible with the class of meter under test and as per the Prudent Utility Practices. Further the IPP shall at its own expense, have the Sub Standard meter tested, calibrated and certified by a recognised and independent Testing House/Laboratory, mutually acceptable to the Parties, once during every year (or more frequently upon the reasonable request of the Company or the Board) with reference to the relevant Indian standard or I.E.C. where Indian standard is not existing. Each such meter shall be deemed to be working satisfactorily so long as the errors are within the limits prescribed in the relevant Indian standard (or I.E.C where Indian standard is not existing) for meters of the said accuracy class. The consumption registered by a Main Meter alone will hold good for the purpose of billing as long as the error in the Main Meter is within the permissible limits.

(b) Any Party can request for additional metering test and the additional test shall be conducted within seven (7) days of receipt of such notice. The Parties shall agree to a mutually convenient time for such inspections or tests and the expense of any requested additional inspections or tests requested by a Party shall be borne by the Party requesting such additional test. However, if upon such testing, the metering equipment is found to register beyond the permissible limits of error, the expenses will be borne by the other party.

7.6 If during the half yearly test checks, the Main Meter is found to be within the permissible limits of error and the corresponding Check Meter is found to be beyond the permissible limits of error, then billing will be as per the Main Meter as usual. The corresponding Check Meter shall, however, be calibrated or replaced with spare tested calibrated meter, as may be necessary.

7.7 If during the half yearly test checks, the Main Meter is found to be beyond permissible limits of error but the Check Meter is found to be within permissible limits of error, then the billing for the month and upto the date and time of the calibration/replacement of the defective Main Meter, shall be as per the Check Meter. Such meter shall be immediately calibrated or replaced with the spare tested/ calibrated meter, as may be necessary, whereafter billing shall be as per the Main Meter.

7.8 If during the half yearly test checks, the Main Meter and the Check Meter are both found to be beyond the permissible limits of error, then both the meters shall be immediately replaced with spare calibrated meters and the correction applied to the consumption registered by the Main Meter to arrive at the correct consumption of Energy for billing purposes for the period of two Billing Months prior to the month in which test check has been done and upto the time of calibration/replacement of the defective meter.

7.9 Corrections in billing, wherever necessary, shall be for the full value of the absolute error. For the purpose of the correction to be applied, the Main Meter shall be tested at (a) 100, (b) 50, (c) 20 and (d) 10 percent load at unity power factor as well as 0.9 power factor lagging. Of these eight values, the error at the load and power factor nearest to the average monthly load served through the meter at the Interconnection Point during the period shall be taken as the error to be applied for correction.

Pending such calibration of the Main Meter, billing and payment shall be provisionally based on the Energy recorded by the Check Meter and will be subject to adjustment on testing of the Check Meter.

If on such testing, the error in both the Main Meter and the Check Meter is found to exceed the maximum permissible error for a meter of that accuracy Class (0.5), the Energy figure recorded by such Main Meter for the previous Billing Month (i.e. the month for which final reading was taken as per first sub para of this Section) and upto the date of removal of such meter in the current month shall be corrected by applying correction factor as per Section 7.9.

If on testing, error in the Main Meter is within accuracy limit and the Check Meter is beyond the accuracy limit, the Main Meter reading shall be used for billing and Check Meter shall be recalibrated.

If on testing, error in the Check Meter is within the accuracy limit and error in Main Meter is beyond accuracy limit, then Check Meter reading shall be used for billing purposes for the previous Billing Month (i.e. the month for which final reading was taken as per first sub para of this Section) and the Main Meter shall be recalibrated. Till calibration/replacement of the Main Meter is done, the meter reading of the Check Meter shall continue to be used for billing purposes.

If on testing, the Main Meter and the Check Meter are both found to be within the accuracy limits, the readings of the Main Meter shall continue to be adopted for billing purposes.

7.11 If the Main Meter and the Check Meter fail to record or if any of the PT fuses have blown out, then the Energy will be computed on a mutually agreeable basis between the Company and the Board for that period of defect. In case there is no mutual agreement then the matter will be referred to the Chief Electrical Inspector to the Government of Himachal Pradesh whose decision would be final and binding on both the Parties.

7.12 All the tests on the Main and Check Meter shall be conducted in the presence of the authorised staff of the Parties and the results and correction so arrived at will be applicable and binding on both the Parties.

7.13 Any Dispute regarding measurement of Energy, which does not get resolved through mutual negotiations, shall be referred by the either Party to the Chief Electrical Inspector to the Government of Himachal Pradesh, whose decision shall be final and binding on both the Parties.

7.14 For the purpose of taking joint meter readings and other activities in pursuance of this Article, the Board as well as the Company will designate their official(s) within 15 days after issuance of the notice by the Company under Section 4.1.1. Either Party shall be entitled to change the nomination of its designated official(s) by giving a notice of atleast fifteen (15) days to the other Party.

7.15 Monthly joint meter readings of the Main Meter and Check Meter installed at the Interconnection Point shall be taken by the designated officials of the two Parties on the Synchronisation Date of each Unit as well as at 12.00 hours on the first day of the next month in which the first Unit is Synchronised and subsequently also at 12.00 hours of the first day of

representatives of the Board and the Company are not available for recording the readings of Main/Check Meter at the Interconnection Point, at the said hour, the meter(s) shall be read jointly at 12.00 hours on the following day; failing which the meter(s) shall be read by the Party present at the site, who shall certify the meter readings. If the representative of the Board does not attend to the verifications and certification of the statement, the certificate of the Company alone shall be considered sufficient for release of payment in the interim. Registers shall be maintained by the Company and the Board separately for the joint meter readings recorded at the Interconnection Point. Separate joint meter readings shall also be taken at the time of removal/replacement of any of the Main Meter/Check Meter.

7.16 On the last day of each month, the Company shall prepare a statement in respect of Water Spillage and loss of generation, if any, at the Station to be considered for determination of Saleable Deemed Generation during the month. The above statement duly signed together with the copies of the relevant log book(s) and other supporting data shall be supplied at the time of recording of joint meter reading on first day of each month. This statement shall be reconciled and signed by the designated officers of the Board and the Company.

7.17 After recording the meter readings referred to in Section 7.15, the designated officers of the Board and the Company or the Party present, as per provisions of Section 7.15, shall work out the total Energy delivered/imported by the Company at the Interconnection Point, the quantum of Govt. Supply & the Net Saleable Energy. The statement to this effect, shall be signed by said designated Officer(s) and will form the basis for preparation of monthly bills by the Board and the Company.

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Annexure 2

Dharmshala Hydro Power Limited

4.5 MW Maujhi SHP – List of Energy Meter Test Reports

S.No.	Meter No.	Make	Test Report Date
	Main Meter		
1	03158275	L&T	18-May-2004
2	03158275	L&T	7-Jul-2005
3	03158275	L&T	1-Mar-2006
4	03158275	L&T	1-Dec-2006
5	03158275	L&T	12-Jun-2007
	Check Meter		
6	03158261	L&T	18-May-2004
7	03158261	L&T	7-Jul-2005
8	03158261	L&T	1-Mar-2006
9	03158261	L&T	1-Dec-2006
10	03158261	L&T	12-Jun-2007

1

Put. Meter

Duplicate

Electronic Trivector Meter

H. P. S. E. B Form CS—21

H. P. S. E. B

Test Results

MAINTENANCE AND TEST DI /ISION

METER TEST AND MOVEMENT CARD

Meter No. (Maker's) 03158275 Meter No. (E. B.) MTK-970

Make L&T Phase 3 Ø 4 wire Amps. - /2 Amp. Volts. - /110 V

Date	Starting Current	Full load	Half load	Quarter load	Tenth load	Twentieth load	0.5 P. F. Full load	H. V. Test	Insulation Resistance	Tested by
18/5/2004	Ok	Meter has bee checked with and found ok Starting Current & Creep test Ok								

Assistant Engineer
M & T Sub Division
HPSEB Kangra

[P. T. O.

Rit. Meter Electronic Trivector Meter Duplicate

H. P. S. E. B Form CS—21

H. P. S. E. B
MAINTENANCE AND TEST DIVISION

Test Results

METER TEST AND MOVEMENT CARD

Meter No. (Maker's) 03158275 Meter No. (E. B.) MTK 970

Make L&T Phase 3φ 4 wire Amps 3×-/1 Amp Volts 3×-/110 volts

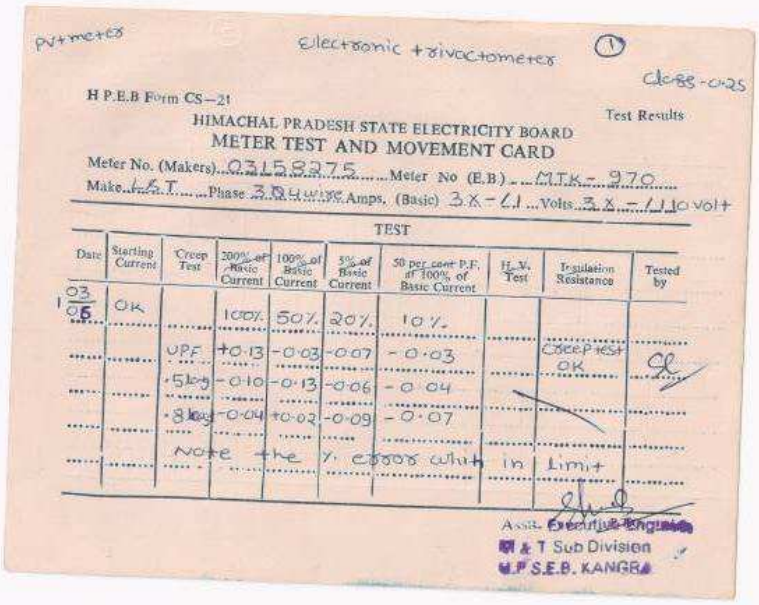
Date	Starting Current	Full load	Half load	Quarter load	Tenth load	Twentieth load	0.5 P. F. Full load	H. V. Test	Insulation Resistance	Tested by
7/7/05	ok			100%	5%	10%	Creep test			
	UPF			-0.16	-0.07	-0.07			ok	
	.5 lag		-	0.10	-0.18	-0.06				
	.8 lead			-0.14	-0.09	-0.07				

Reading:
KWh = 333.57
KVArh exp. 36.10
— w. load 0.12
KVAh. 329.12

[illegible]
Asstt. Executive Engineer
M & T Sub Division
H.P.S.E.B. KANGRA

P. T. O.

3



pv+meter

Electronic trivactometer (1)

Class-0.25

H P.E.B Form CS—21

Test Results

HIMACHAL PRADESH STATE ELECTRICITY BOARD

METER TEST AND MOVEMENT CARD

Meter No. (Makers) 03158275 Meter No (E.B.) MTK-970

Make L&T Phase 3Ø4 wire Amps. (Basic) 3X-1.1 Volts 3X-110 volt

TEST

Date	Starting Current	Creep Test	200% of Basic Current	100% of Basic Current	5% of Basic Current	50 per cent P.F. at 100% of Basic Current	H.V. Test	Insulation Resistance	Tested by
03/06	OK		100%	50%	20%	10%			
		UPF	+0.13	-0.03	-0.07	-0.03		CREEP TEST OK	CL
		.5 log	-0.10	-0.13	-0.06	-0.04			
		.8 log	-0.04	+0.02	-0.09	-0.07			
		Note the % errors with in limit							

Asstt. Executive Engineer
M & T Sub Division
H.P.S.E.B. KANGRA

Rat-Meter ELECTRONIC TRIVECTOR METER RE-TEST

H.P.E.B Form CS—21 CLASS 0.25

Test Results

(13)

HIMACHAL PRADESH STATE ELECTRICITY BOARD

METER TEST AND MOVEMENT CARD

Meter No. (Makers) 03158875 Meter No (E.B.) MTK 990

Make L&T Phase 3 Φ 4 wire Amps. (Basic) 5A - 1 Volts 3Φ - 110 Volt

TEST

Date	Starting Current	Creep Test	20% of Basic Current	100% of Basic Current	5% of Basic Current	50 per cent P.F. at 100% of Basic Current	H. V. Test	Insulation Resistance	Tested by
12/2016	OK		100%	50%	20%	10%			
		UPP	+0.16	-0.07	+0.05	-0.07		Creep test OK	
		5 Disc	0.10	-0.18	-0.12	-0.06			
		Bleed	± OK	-0.09	-0.09	-0.07			
		the	%	error with in limit					

Ass. Executive Engineer
P.T.S.
T & T Sub Division
H.P.S.E.B. KANGRA

4

Rt-Meter   Electronic Trivector Meter   Re-Test

Class 0.2s

H. P. S. E. B Form CS—21   H. P. S. E. B   Test Results

MAINTENANCE AND TEST DIVISION

METER TEST AND MOVEMENT CARD

Meter No. (Maker's) 03158275 ... Meter No. (E. B.) 9EUS 970 ...

Make... L+T ... Phase 3Φ 4wire Amps 3×-/1 Amp Volts ... 3×-/110V

Date	Starting Current	Full load	Half load	Quarter load	Tenth load	Twentieth load	0.5 P. F. Full Load	H. V. Test	Insulation Resistance	Tested by
12.06.07	O/c			100%	50%	20%	10%		Creeping	
		UPF		+0.18	-0.08	-0.03	-0.04		[illegible]	
		·5lag		-0.11	+0.16	+0.14	-0.12		O/c	[illegible]
		·8lead		-0.04	+0.02	-0.02	-0.14			
	Note: The % Error with in limit.									
Display — 2.										

Kwh 856.15
Kvah 863.85
Kwh — 1.22
Kvah — 1.36

[illegible]
Asstt. Executive Engineer
M & T Sub Division
H.P.S.E.B. KANGRA

P.T.O.

6

Ref. Meter

Duplicate

Electronic Trivector Meter

H. P. S. E. B. Form CS—21

H. P. S. E. B.

Test Results

MAINTENANCE AND TEST DIVISION

METER TEST AND MOVEMENT CARD

Meter No. (Maker's) 03158261 Meter No. (E.B.) MTK 968

Make L.G.T. Phase 3 Ø 4 wire Amps 1/4 Amps Volts 110 V.

Date	Starting Current	Full load	Half load	Quarter load	Tenth load	Twentieth load	.5 P. F. Full Load	H. V. Test	Insulation Resistance	Tested by
18/5/2004	Ok	Dial Test has been Checked with ERS Meter and found Ok. Starting Current and Creep test Ok.								

Assistant Engineer
M & T Sub Division
HPSEB, Kangra [H. T. O.

7

Kd. Meter Electronic Trivector Meter Duplicate

H. P. S. E. B. Form CS–21 H. P. S. E. B Test Results

MAINTENANCE AND TEST DIVISION

METER TEST AND MOVEMENT CARD

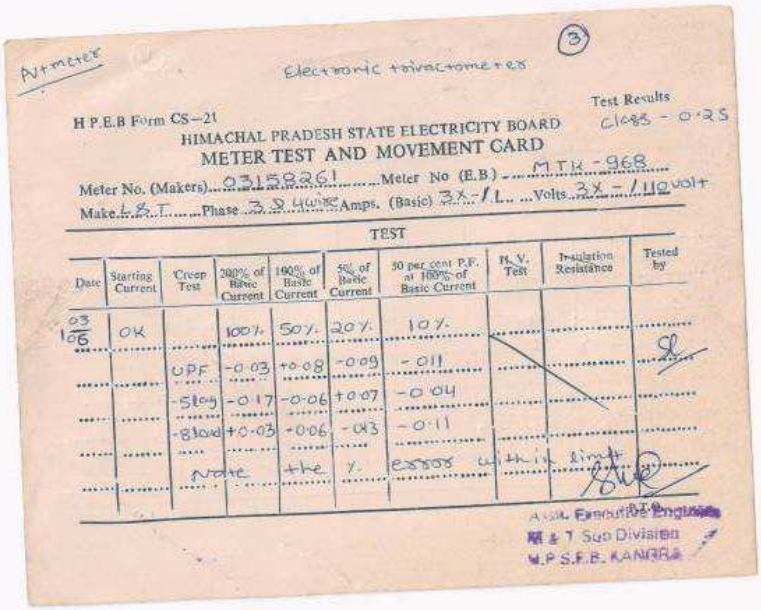
Meter No. (Maker's) 03153261 Meter No. (E. B.) 0114 968

Make L+T Phase 3 φ 4 wire Amps 20-/100 Volts 3 x 110 volts

Date	Starting Current	Full load	Half load	Quarter load	Tenth load	Twentieth load	0.5 P. F. Full Load	H. V. Insulation Test Results	Tested by
7/2/15	OK		100	50	20	10	Creep Test etc.		
	UPF	-0.01	+0.06		-0.11				
	.5 Lag.	-0.17	-0.06		-.04				
	.8 Lead	-0.02	P.F.		-0.06				
Reading.									
	Kwh	-	335	59					
	Kwh by eq. = 336.01								
	— on test = 0.12								
	Kwh = 335.08								

Executive Engineer
M & T Sub Division
G.P.S.E.B. KANDLA
P. T. O.

8



Avmeter

Electronic trivactrometers

(3)

H.P.E.B Form CS–21

Test Results
Class - 0.2S

HIMACHAL PRADESH STATE ELECTRICITY BOARD

METER TEST AND MOVEMENT CARD

Meter No. (Makers) 03158261 Meter No (E.B) MTK-968

Make L&T Phase 3 3 4 wire Amps. (Basic) 3X-1L Volts 3X-110volt

TEST

Date	Starting Current	Creep Test	200% of Basic Current	100% of Basic Current	5% of Basic Current	50 per cent P.F. at 100% of Basic Current	H. V. Test	Insulation Resistance	Tested by
03/05	OK		100%	50%	20%	10%			
		UPF	-0.03	+0.08	-0.09	-011			
		-Slag	-0.17	-0.06	+0.07	-0.04			
		-Blood	+0.03	-0.06	-.03	-0.11			
		Note	the	%	excess	within limit			

Asstt. Executive Engineer
M & T Sub Division
H.P.S.E.B. KANGRA

Pat-meter Electronic Trivector meter Re-Test

Class 0.25

Test Results

H.P.E.B Form CS—21

HIMACHAL PRADESH STATE ELECTRICITY BOARD

METER TEST AND MOVEMENT CARD

(9)

Meter No. (Makers) 03158261 Meter No (E.B.) MTK-968

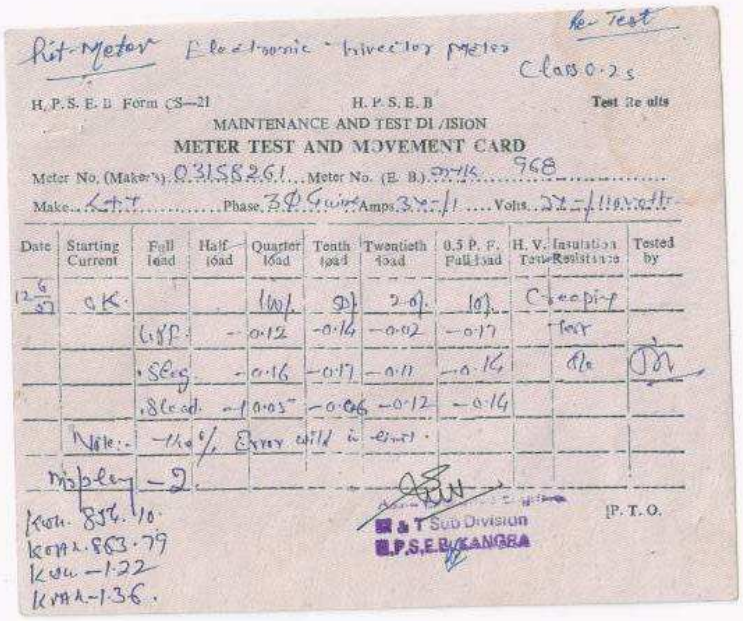
Make L&T Phase 3P 4 wire Amps. (Basic) 3x-/1 Volts 3x-/110 volt

TEST

Date	Starting Current	Creep Test	200% of Basic Current	100% of Basic Current	5% of Basic Current	30 per cent P.F. at 100% of Basic Current	H. V. Test	Insulation Resistance	Tested by
12/5/06	OK		100%	50%	20%	10%		Creep Test	
		UPP	-0.02	+0.04	-0.06	-0.14			OK
		5Deg	-0.14	-0.02	+0.04	-0.06			
		8Lead	-0.01	+0.15	-0.02	+0.07			
	The	0%	error within limit						

A.E.O.

Asstt. Executive Engineer
T & T Sub Division
H.P.S.E.B. KANGRA



Pit-Meter Electronic trivector meter Re-Test
Class 0.2s

H. P. S. E. B Form CS—21 H. P. S. E. B Test Results

MAINTENANCE AND TEST DIVISION

METER TEST AND MOVEMENT CARD

Meter No. (Maker's) 03158261 Meter No. (E. B.) 968

Make L&T Phase 3P.4wire Amps 3x-1 Volts 3x-110 volts

Date	Starting Current	Full load	Half load	Quarter load	Tenth load	Twentieth load	0.5 P. F. Full load	H. V. Test	Insulation Resistance	Tested by
12/6/87	O.K.			100%	10%	5%	10%	Checking		
		Unity	-	-0.12	-0.14	-0.02	-0.17	Test		
		Sleg	-	-0.16	-0.17	-0.11	-0.16	Do		
		Lead	-	0.03"	-0.06	-0.12	-0.14			
	Note:-	-1%	%	Error will	be	Error.				
	Mobile	-2								

From 854.10
KWH 863.79
KVA -1.22
KWH-1.36.

T & T Sub Division
P.S.E.B. KANGRA

P. T. O.