Enquiry

Bharat Heavy Electricals Limited
Transmission Business Group
Materials Management

Project : BHEL TBG

Enquiry No	Enquiry Dt	Rev No	Rev Dt	PI No	Enquiry Type	Inspection by	Due Dt	Commercial Comments	Technical Comments	Signing Authority
274R053	23-Jun-14	0		342240026	Package		18-Jul-14			Sr.Engineer/TBM

Document Enclosed

- Technical Specifications
- Terms & Conditions for Indigenous Enquiry
- Activity Schedule
- Schedule of Commercial Deviation
- Schedule of Technical Deviation

SN	Equipment	Phy Unit	Qty	Unit Exworks	Unit Packing	% ED	% CST	% VAT	% ST	Unit F&I	Plan Dt	Comments
1	ACSR BERSIMIS CONDUCTORS	KM	20									
2	ACSR MOOSE CONDUCTORS	KM	500									
3	ACSR ZEBRA CONDUCTORS	KM	150									

You are requested to submit your most competitive offer so as to reach us positively by the tender opening date & time. THE TENDERS NOT RECEIVED WITHIN SCHEDULED DATE AND TIME ARE LIKELY TO BE IGNORED. BHEL shall not be responsible for any postal delay.

IN YOUR OWN INTEREST YOU ARE ADVISED TO CAREFULLY READ "THE INSTRUCTIONS TO BIDDERS". INCOMPLETE BIDS AND/OR BIDS NOT COMPLYING WITH TENDER CONDITIONS SHALL BE TREATED AS NON RESPONSIVE AND ARE LIKELY TO BE IGNORED.

In case Tender Documents are not received within 7 days of this E-mail message, intimate BHEL accordingly. If no intimation is received, it will be considered that you have received tender enquiry and delay in submission offer due to late receipt of tender documents will not be entertained.

YOU ARE REQUESTED TO SUBMIT YOUR MOST COMPETITIVE OFFER SO AS TO REACH US POSITIVELY BY 2 PM ON THE TENDER OPENING DATE AND TENDER WILL BE OPENED AT 2:30 PM WITH EFFECT FROM 15-SEP-09.

BHEL RESERVES THE RIGHT TO OPT FOR REVERSE AUCTION FOR OBTAINING BEST PRICES.

OFFERS THROUGH E-MAIL / FAX:

WHOSOEVER DESIRES TO SEND OFFERS ON THEIR OWN RISK (COMPLETE IN ALL RESPECTS) VIA E-MAIL or FAX HAVE TO SEND THE OFFERS TO THE COMMON E-MAIL ADDRESS tenderbox@bhel.in or 0120-6748581 FAX .

THE RECEIVED EMAIL OFFERS WILL BE PRINTED BY PURCHASE COORDINATOR AND PUT THEM INTO COVERS AS PER CONVENTIONAL METHOD FOR TENDER OPENING I.E., TECHNO COMMERCIAL & PRICE OFFER SHALL BE PUT INTO TWO SEPARATE COVERS AND BOTH THE COVERS ARE KEPT IN THIRD COVER DULY SUPER SCRIBING ENQY. NO. AND DUE DATE.

OFFERS SENT TO ANY OTHER E-MAIL ID or FAX NO AND INCOMPLETE OFFERS SHALL NOT BE CONSIDERED FOR EVALUATION PURPOSE.

It is suggested that the bidders are advised to send the files with 'password protection'. procedure for giving a password to a file has been given below:

For saving Excel file with password

Steps to be followed:

1. Click on the FILE option in XP system and Start sign in Vista system then go to SAVE AS option.
2. Select the location to save and Click on the TOOLS box and go to GENERAL OPTION.
3. It will ask for the password, type the password into open or modify box or both as required.
4. Then click on the OK button it will ask for reenter of the password.
5. After reentering the password click on the save box.

For saving Word file with password

Steps to be followed:

1. Click on the FILE option in XP and Start sign in Vista then go to SAVE AS option.
2. Select the location to save and Click on the TOOLS box and go to SECURITY OPTION in XP system and GENERAL OPTION in Vista system.
3. It will ask for the password, type the password into open or modify box or both as required.
4. Then click on the OK button it will ask for reenter of the password.
5. After reentering the password click on the save box.

The venders who has sent offers with password,the passwords are to be forwarded to another email id:supplierinfo@bhelindustry.com

MSME STATUS

"THOSE INDUSTRIES WHO HAVE FILED A MEMORANDUM WITH THE CONCERNED AUTHORITIES AND REGISTERED AS MICRO & SMALL ENTERPRISE UNDER MICRO, SMALL AND MEDIUM ENTERPRISES DEVELOPMENT ACT 2006, HAVE TO SUBMIT A COPY OF SUCH REGISTRATION CERTIFICATE / MEMORANDUM TO BHEL FOR NECESSARY COMPLIANCES OF THE ABOVE ACT".

Please acknowledge the receipt of tender enquiry and fax back this letter by ticking the appropriate item below.

for BHARAT HEAVY ELECTRICALS LTI

We acknowledge the receipt of tender.

(a) The offer against subject enquiry shall be submitted by the scheduled date and time.

(b) We regret to quote. The item in reference is out of our manufacturing range.

(c) We regret because of our prior commitments.

(d) Any other reason.

To
S C Shivhare
Sr.Manager
BHARAT HEAVY ELECTRICALS LIMITED
TRANSMISSION BUSINESS GROUP
TOWER-A,5th Floor,
Advant Navis IT Business Park,
Plot No-7,Sector-142,Expressway Noida
Noida-201305
Distt. Gautam BudhNagar,U.P

Ph: 0120-6748471
Fax: 0120-6748581

Signature and Seal of Tenderer

Enquiry No : 274R053 **Enquiry Dt :** 23-Jun-14

BHARAT HEAVY ELECTRICALS LIMITED

TRANSMISSION PROJECTS ENGINEERING MANAGEMENT

DOCUMENT No.	TB-xxx-316-019	Rev no.-00	Prepared	Checked	Approved
TYPE OF DOC.	TECHNICAL SPECIFICATION	NAME	MLK	SKS	SKS
TITLE		SIGN			
RATE CONTRACT FOR ACSR MOOSE, BERSIMIS & ZEBRA CONDUCTOR		DATE	15.05.14		
		GROUP	TBEM	W.O. No	
CUSTOMER/ CONSULTANT					
PROJECT					

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Rev No.	Date	Altered	Checked	Approved	REVISION DETAILS

Distribution	To Copies				TBQM	TBCM
					-	-

SECTION – I

SCOPE, SPECIFIC TECHNICAL REQUIREMENT AND QUANTITIES

1.0 SCOPE

This technical specification covers the requirements of design, manufacture, testing at works, packing and dispatch of ACSR Moose/Bersimis/Zebra Conductor.

The equipment is required for the following project.

Name of the customer : (As per Project)

Name of the Project : (As per Project)

1.1 BILL OF QUANTITY

Sl. No.	Description	Quantity
1.	**ACSR Moose Conductor**	**500Km**
2.	**ACSR Bersimis Conductor**	**20 Km**
3.	**ACSR Zebra conductor**	**150 Km**

1.2 MANDATORY TYPE TESTS

Bidder shall submit the valid type test reports for the following type tests which should have been conducted within five years from the date of bid opening. If the bidder is not having valid type test reports, the type tests shall be conducted by the bidder without any commercial implication to BHEL.

1. UTS test
2. Corona extinction voltage test (dry)
3. Radio interference voltage test (dry)
4. DC resistance test

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SECTION – II

STANDARD TECHNICAL SPECIFICATION

2.1 This section covers the standard technical requirements of the ACSR Moose/Bersimis/Zebra Conductor. In case of any discrepancies between the requirements mentioned in this section and those specified in other sections of this specification, the later shall prevail and shall be treated as binding requirements.

2.2 TECHNICAL REQUIREMENTS

1. Conductor type : ACSR
2. Commercial name item : MOOSE/BERSIMIS/ZEBRA

2.2.1 The details of the conductor are tabulated below:

		ACSR MOOSE	ACSR BERSIMIS	ACSR ZEBRA
a)	Stranding and wire Diameter in mm	54/3.53 mm Al+7/3.53 Steel	42/4.57 mm Al+7/2.54 Steel	54/3.18 mm Al+7/3.18 Steel
b)	Number of strands			
	Steel center	1	1	1
	1st steel layer	6	6	6
	1st Aluminium layer	12	8	12
	2nd Aluminium layer	18	14	18
	3rd Aluminium layer	24	20	24
c)	Sectional area of aluminium	528.5 mm^2	689.5 mm^2	428.90 mm^2
d)	Total sectional area	597.00 mm^2	725.00 mm^2	484.50 mm^2
e)	Overall diameter	31.77 mm	35.05 mm	28.62 mm
f)	Approximate weight	2004 kg/km	2181 kg/km	1621 kg/km
g)	Calculated d.c. resistance at 20°C	0.05552 ohm/km	0.04189 ohm/km	0.06869 ohm/km
h)	Minimum UTS	161.2kN	154 kN	130.32kN
i)	Drum Length	As required, generally 1500 – 1800m	As required, generally 1500 – 1800m	As required, generally 1500 – 1800m

2.2.2 The details of **aluminium strand** are as follows:

i)	Minimum breaking load of strand - before stranding - after stranding	 1.57kN 1.49kN	 2.64kN 2.51kN	 1.29kN 1.23kN
ii)	Max. D.C. resistance of strand at 20°C	2.921 ohm/km	1.738 ohm/km	3.651 ohm/km

2.2.3 The details of steel strand are as follows:

i)	Minimum breaking load of strand - before stranding - after stranding	 12.86 kN 12.22 kN	 6.87 kN 6.53 kN	 10.43 kN 9.91 kN
ii)	Minimum number of twist to be withstood in torsion test when tested on a gauge length of 100 times diameter of wire	18-before stranding 16-after stranding	18-before stranding 16-after stranding	18-before stranding 16-after stranding

2.3 APPLICABLE STANDARDS

The ACSR Moose/Bersimis/Zebra Conductor shall strictly conform to the following Indian and International standards, as appropriate:

IS 398 (Part-V): 1992 Aluminium conductors galvanized Steel reinforced

IS 2629:1990	Recommended practice for hot dip galvanizing on iron and steel.
IS 4826:1992	Hot dip galvanized coatings on round steel wires
IS 2633:1992	Method for testing uniformity of coating of zinc--coated articles.
IS 6745: 1990	Methods for determination of mass of Zinc coating on zinc coated iron and steel articles
IS 8263:1990	Methods for radio interference test
IS 1778:1980	Reels and drums for bare conductors
IS 1521:1991	Method for tensile testing of steel wire

2.4 TECHNICAL REQUIREMENT AND CONSTRUCTIONAL DETAILS

2.4.1 The finished conductor shall be smooth, compact, uniform and free from all imperfections including spills and splits, die marks, scratches, abrasion, scuff marks, kinks (protrusion of wires), dents, press marks, cut marks, wire cross over, over riding, looseness (wire being dislocated by finger/hand pressure and/or unusual bangle noise on tapping), material inclusions, white rust, power formation or black spots (on account of reaction with trapped rain water etc.), dirt, grit etc.

2.4.2 All the aluminium and steel strands shall be smooth, uniform and free from all imperfections, such as spills and splits, die-marks, scratches, abrasions and kinks after drawing.

2.4.3 The steel strands shall be hot dip galvanized and shall have a minimum Zinc coating of 260 gm/m^2 after stranding of the uncoated wire surface. The zinc coating shall be smooth, continuous and of uniform thickness, free from imperfections and shall withstand minimum three dips after stranding in standard Preece Test. The finished strands and the individual wires shall be of uniform quality and have the same properties and characteristic as prescribed in ASTM designation: B 498-74.

2.4.4 The steel strands shall be preformed and post-formed in order to prevent spreading of strands in the event of cutting of composite core wire. Care shall be taken to avoid damage to galvanization during pre-forming and post-forming operation.

2.5 Joints in wires

2.5.1 Aluminium wires

No joints shall be permitted in the individual wires in the outermost layer of the finished conductor. However, joints in the 12 wire and 18 wire inner layers of the conductor shall be allowed but these joints shall be made by cold pressure butt welding and shall be such that no such joints are within 15 metres of each other in other in the complete stranded conductor.

2.5.2 Steel wires

There shall be no joint of any kind in the finished wire entering into the manufacture of the strand. There shall also be no strand splices in any length of the completed stranded steel core of the conductor.

2.6 Tolerances

The manufacturing tolerances to the extent of the following limits only shall be permitted in the diameter of individual aluminium and steel strands and lay-ratio of the conductor.

a) Diameter of aluminium and steel strands (in millimeters):

	ACSR MOOSE			ACSR BERSIMIS			ACSR ZEBRA		
	Standard	Maximum	Minimum	Standard	Maximum	Minimum	Standard	Maximum	Minimum
Aluminium	3.53	3.55	3.51	4.57	4.61	4.53	3.18	3.21	3.15
Steel	3.53	3.60	3.46	2.54	2.57	2.51	3.18	3.24	3.12

b) Lay ratio of conductor:

		ACSR MOOSE		ACSR BERSIMIS		ACSR ZEBRA	
		Maximum	Minimum	Maximum	Minimum	Maximum	Minimum
Steel	6-wire layer	18	16	18	13	18	13
Aluminium	12-wire layer	14	12	17	10	17	10
	18-wire layer	13	11	16	10	16	10
	24-wire layer	12	10	14	10	14	10

2.7 Materials

2.7.1 Aluminium

The aluminium strands shall be hard drawn from electrolytic aluminium rods having purity not than 99.5% and a copper content not exceeding 0.04%

2.7.2 Steel

The steel wire strands shall be drawn from high carbon steel wire rods and shall conform to the following chemical composition:

Element	-	**% composition**
Carbon	-	0.50 to 0.85
Manganese	-	0.50 to 1.10
Phosphorous -	-	not more than 0.035
Sulphur	-	not more than 0.045
Silicone	-	0.10 to 0.3

2.7.3 Zinc

The zinc used for galvanizing shall be electrolytic high grade zinc of 99.95% purity. It shall conform to and satisfy all the requirements of IS: 209-1979.

2.8 Standard length

The conductor shall be supplied in lengths as required generally in the range of 1500/ 1800 metres.

2.9 Tests:

2.9.1.A The conductor should have type tested as per IEC/IS and shall be subjected to routine and acceptance tests in accordance with applicable IS specifications/ISO/ASTMA recommendations. Type test reports of the tests conducted earlier (not more than 5 years earlier) on similar material shall be submitted. If the valid type test reports are not available with the bidder than the test shall be conducted by the bidder free of cost.

2.9.1.B TYPE TESTS

In accordance with the stipulation of the specification the following type tests shall be conducted on the conductor:

a)	UTS test	As per clause No. 2.10.1 below (The number of samples shall be mutually agreed)
b)	Corona extinction voltage test (dry)	As per clause No. 2.10.2 below
c)	Radio interference voltage test (dry)	As per clause No. 2.10.3 below
d)	DC resistance test	As per clause No. 2.10.4 below

2.9.2 Acceptance tests: Tests to be conducted

a)	Visual check for joints, scratches, etc. and lengths of conductor	As per clause No. 2.10.7 below
b)	Dimensional check on strands	As per clause No. 2.10.8 below
c)	Check for lay ratio of various layers	As per clause No. 2.10.9 below
d)	Galvanizing test on steel strands	As per clause No. 2.10.10 below
e)	Torsion and elongation test on steel strands	As per clause No. 2.10.11 below
f)	Breaking load test on strands	As per clause No. 2.10.12 below

In addition wrap test on steel and aluminium strands, dc resistance test on aluminium strands and UTS test on welded joint of aluminium strands shall be carried out as per clauses 12.5.2,12.7& 12.8 respectively of IS:398 (part V)1982.

NOTE:
All the above tests except test mentioned at (a) shall be carried out on aluminium and steel strands after stranding only.

2.9.3 Routine tests: Tests to be conducted

a) Check to ensure that the joints are as per specification.
b) Check that there are no cuts, fins etc. on the strands
c) All acceptance test as mentioned in clause 2.9.2 above to be carried out on each coil.

2.9.4 Tests during manufacture

a)	Chemical analysis of zinc used for galvanizing	As per clause No. 2.10.5
b)	Chemical analysis of aluminium used for making aluminium stands	As per clause No. 2.10.6
c)	Chemical analysis of steel used for making steel strands	As per clause No. 2.10.6

2.9.5 Sample batch for type testing

The contractor shall offer material for selection of samples for type testing, only after getting quality assurance plans approved from owner's quality assurance department. The sample shall be manufactured strictly in accordance with the quality assurance plan approved by owner.

2.10 TESTING PROCEDURE FOR ACSR MOOSE/ZEBRA CONDUCTOR/BERSIMIS CONDUCTOR

2.10.1 UTS Test on Stranded Conductor

Circles perpendicular to the axis of the conductor shall be marked at two places on a sample of conductor of minimum 5 m length suitably compressed with dead end clamps at either end. The load shall be increased at a steady rate up to 80 kN and held for one minute. The circles drawn shall not be distorted due to relative movement of strands. Thereafter the load shall be increased at a steady rate to 161.2 kN and held for one minute. The applied load shall then be increased until the failing load is reached and the value recorded.

2.10.2 Corona Extinction Voltage Test

Two samples of conductor of 5m length shall be strung with a spacing of 450 mm between them at a height not exceeding 8.0 m above ground. This assembly shall be tested as per Section 3, corona extinction voltage shall not be less than 320kV (RMS) Line to ground for 400 kV system.

2.10.3 Radio Interference Voltage Test

The sample assembly similar to that specified above shall be tested as per Section 3. Maximum RIV level (across 300 ohm resistor at 1 MHz) at 305 kV (RMS) line to ground voltage shall be 1000 μV.

2.10.4 D.C Resistance Test on Stranded Conductor

On a conductor sample of minimum 5 m length two contact clamps shall be fixed with a pre-determined bolt torque. The resistance shall be measured by a Kelvin

double bridge by placing the clamps initially zero meter and subsequently one meter apart. The test shall be repeated at least five times and the average value recorded. The value obtained shall be corrected to the value at 20^0C as per clause no. 12.8 of IS:398 (Part V)-1982.The resistance corrected at 20^0C shall conform to the requirements of this specification.

2.10.5 Chemical Analysis of Zinc

Samples taken from the zinc ingots shall be chemically/spectrographically analysed. The same shall be in conformity to the requirements stated in this specification.

2.10.6 Chemical Analysis of Aluminium and Steel

Samples taken from the Aluminium ingots/ coils/ strands shall be chemically/ spectrographically analyzed. The same shall be in conformity to the requirements in this specification.

2.10.7 Visual Check for Joints, Scratches etc.

Conductor drums shall be rewound in the presence of the inspector. The inspector shall visually check for scratches, joints, etc. and that the conductor generally conforms to the requirements of this specification. The length of conductor wound on the drum shall be measured with the help of counter meter during rewinding.

2.10.8 Dimensional Check for steel and Aluminium Strands.

The individual strands shall be dimensionally checked to ensure that they conform to the requirements of this specification.

2.10.9 Check for Lay –ratios of various Layers.

The lay-ratios of various layers shall be checked to ensure that they conform to the requirements of this specification and clause no. 9.4 and 9.5 of IS-398 (Part-V) 1982.

2.10.10Galvanising Test

The test procedure shall be as specified in IS: 4826-1968. The material shall conform to the requirements of this specification.

2.10.11Torsion and Elongation Tests on Steel Strands

The test procedures shall be as per relevant clauses of IS 398 (Part V): 1982. In torsion test, the number of complete twists before fracture shall not be less than 18 on a length equal to 100 times the standard diameter of the strand before stranding & 16 after stranding. In case test sample length of less or more than 100 times the standard diameter of the strand, the minimum number of twist will be proportionate to the length and if number comes in the fraction then it will be rounded off to next higher whole number. In elongation test, the elongation of the strand shall not be less than 4% for a gauge length of 200 mm.

2.10.12Breaking load test on welded Aluminium stand:

Two Aluminium wires shall be welded as per the approved quality plan and shall be subjected to tensile load. The welded point of the wire shall be able to with stand the minimum breaking load of the individual strand guaranteed by the bidder.

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SECTION – 3

PROJECT DETAILS AND GENERAL SPECIFICATIONS

3.0 GENERAL

This section stipulates the General Technical Requirements under the contract and will form an integral part of the Technical Specification. The provisions under this section are intended to supplement general requirements for the materials, equipment and services covered under other sections and are not exclusive. However in case of conflict between the requirements specified in this section and requirements specified under other sections, the requirements specified under respective sections shall hold good.

3.1 SITE INFORMATION

SL.NO.	DESCRIPTION	
3.1	**PROJECT INFORMATION**	
	a) Customer	
	b) Project	
	c) Project location	
	d) Transport facilities Nearest Railway Station/Gauge Distance from Railway Station	
	e) Access roads	
3.2	**SITE CONDITIONS**	
3.2.1	Ambient Temp.	
	a) Maximum Design Ambient air	
	temp. (max.) °C	
	b) Minimum Design Ambient air temp.	
	(max.) °C	
3.2.2	Relative humidity	
3.2.3	Height above mean sea level	
3.2.4	Pollution Severity	
3.2.5	Earth quake data	
	a) Seismic zone as per IS 1893:84	
	b) Seismic acceleration	
3.2.6	Wind data	
	a) Wind velocity m/sec.	
3.2.7	Average annual rainfall	

3.2 INSTRUCTION TO BIDDERS

The bidders shall submit the technical requirements, data and information as per the technical data sheets, provided in Section-4.

The bidders shall furnish catalogues, engineering data, technical information, design documents, drawings etc fully in conformity with the technical specification.

It is recognized that the Manufacturer may have standardized on the use of certain components, materials, processes or procedures different than those specified herein. Alternate proposals offering similar equipment based on the manufacturer's standard practice will also be considered provided such proposals meet the specified designs, standard and performance requirements and are acceptable to the Purchaser. Unless brought out clearly, the Bidder shall be deemed to conform to this specification scrupulously.

3.3 STANDARDS

The works covered by the specification shall be designed, engineered, manufactured, built, tested and commissioned in accordance with the Acts, Rules, Laws and Regulations of India.

The equipment to be furnished under this specification shall conform to latest issue (with all amendments) of specified standards.

In addition to meeting the specific requirement called for in Sections 1 and 2 of the Technical Specification, the equipment shall also conform to the general requirement of the applicable standards, which shall form an integral part of the specification.

The Bidder shall note that standards mentioned in the specification are not mutually exclusive or complete in themselves, but intended to complement each other.

When the specific requirements stipulated in the specifications exceed or differ from those required by the applicable standards, the stipulation of the specification shall take precedence.

Other internationally accepted standards, which ensure equivalent or better performance than that specified in the standards referred, shall also be accepted. The bidder shall submit copies of such standards.

In case governing standard for the equipment is different from IS or IEC, the salient points of difference shall be clearly brought out in the offer along with English language version of standard or relevant extract of the same. The equipment conforming to standards other than IS/IEC shall be subject to Purchaser's / owner's approval.
The bidder shall clearly indicate in his bid the specific standards in accordance with which the works will be carried out.

3.4 SERVICES TO BE PERFORMED BY THE EQUIPMENT BEING FURNISHED

All equipment shall also perform satisfactorily under various other electrical, electromechanical and meteorological conditions of the site of installation All equipment shall be able to withstand all external and internal mechanical, thermal and electromechanical forces due to various factors like wind load, temperature variation, ice & snow, (wherever applicable) short circuit etc for the equipment.

3.5 ENGINEERING DATA

3.5.1 Drawings

The contactor shall necessarily submit all the drawings/ documents unless anything is waived. The contactor shall submit 6 (six) sets of drawings/ design documents/ data/ test reports as may be required for the approval of the purchaser. All drawings submitted by the Manufacturer including those submitted at the time of bid shall be in sufficient detail to indicate the type, size, arrangement, material description, Bill of Materials, weight of each component, break-up for packing and shipment, the external connections, fixing arrangement required. The dimensions required for installation and interconnections with other equipment and materials, clearances and spaces required for installation and interconnections between various portions of equipment and any other information specifically requested in the specifications.

Each drawing submitted by the Manufacturer shall be clearly marked with the name of the Purchaser, the unit designation, the specifications title, the specification number and the name of the Project. If standard catalogue pages are submitted, the applicable items shall be indicated therein. All titles, noting, markings and writings on the drawing shall be in English. All the dimensions should be in metric units.

Further work by the Manufacturer shall be in strict accordance with these drawings and no deviation shall be permitted without the written approval of the Purchaser, if so required.

The review of these data by the Owner will cover only general conformance of the data to the specifications and documents, interfaces with the equipment provided under the specifications, external connections and of the dimensions which might affect substation layout. Owner may not indicate a thorough review of all dimensions, quantities and details of the equipment, material, any devices or items indicated or the accuracy of the information submitted. This review and /or approval by the Owner shall not be considered by the Manufacturer, as limiting any of his responsibilities and liabilities for mistakes and deviations from the requirements, specified under these specifications and documents. All manufacturing and fabrication work in connection with the equipment prior to the approval of the drawings shall be at the Manufacturer's risk. The Manufacturer may make any changes in the design which are necessary to make the equipment conform to the provisions and intent of the Contract and such changes will again be subject to approval by

the Purchaser. Approval of Manufacturer's drawing or work by the Purchaser shall not relieve the manufacturer of any of his responsibilities and liabilities under the Contract.

All engineering data submitted by the Manufacturer after final process including review and approval by the Owner shall form part of the Contract Document and the entire works performed under these specifications shall be performed in strict conformity, unless otherwise expressly requested by the Owner in Writing.

The title block of drawings shall contain the following information incorporated in all contract drawings

Title block for _____ project:

1. Customer :
2. Consultant :
3. Project :
4. Contract No./LOA No. :
5. Main Contractor : Bharat Heavy Electricals Limited
6. BHEL Order No. & Date :

3.5.2 Approval Procedure

The scheduled dates for the submission of these as well as for, any data/information to be furnished by the Purchaser would be discussed and finalised at the time of award. The following schedule shall be followed generally for approval.

	Stage	No. of copies	Submission Schedule /Remarks
i)	Initial Submission Drawings, Data sheets, Type test Reports	6	As per agreed schedule
ii)	Resubmission, if required	6	Within 3 (three) weeks from date of comments including both ways postal time
iii)	Approval or comments		Within 3(three) weeks of receipt of resubmission.
iv)	Furnishing of distribution copies of drawings in bound volume	8	2 Weeks from the date of final approval Five (6) copies for each substation plus two (2) copies for corporate centre.
v)	Furnishing of distribution copies of type test reports in bound volumes	3	2 Weeks from the date of final approval One (1) copies for each substation plus two (2) copies for corporate centre.
vi)	Furnishing of distribution	2	2 Weeks from the date of

	copies of Routine test reports		final approval One (2) copies for each substation
vii)	CD-ROM/ Optical Disc of all documents	3	One (1) set for each substation plus two (2) set for corporate centre.

NOTES:

a) The manufacturer may note that all re-submissions must incorporate all comments given in the prior submission by the Purchaser. Adequate justification for not incorporating the same must be submitted, failing which the submitted documents may be returned.

3.6 QUALITY ASSURANCE PROGRAMME

To ensure that the equipment and services under the scope of this Contract, whether manufactured or performed within the Manufacturer's Works or at his Sub-manufacturer's premises or at the Purchaser's site or at any other place of Work, are in accordance with the specifications, the Manufacturer shall adopt a suitable quality assurance programme to control such activities at all points, as necessary. Such programme shall be outlined by the Manufacturer and shall be finally accepted by the Purchaser after discussions before the award of Contract. A quality assurance programme of the manufacturer shall generally cover the following:

(a) Manufacturer's organisation structure for the management and implementation of the proposed quality assurance programme:
(b) Documentation control system;
(c) Qualification data of bidder's key personnel;
(d) The procedure for purchases of materials, parts components and selection of sub-Manufacturer's services including vendor analysis, source inspection, incoming raw material inspection, verification of material purchases etc.
(e) System for shop manufacturing and site erection controls including process controls and fabrication and assembly control;
(f) Control of non-conforming items and system for corrective actions;
(g) Inspection and test procedure both for manufacture and field activities;
(h) Control of calibration and testing of measuring instruments and field activities;
(i) System for indication and appraisal of inspection status;
(j) System for quality audits;
(k) System for authorising release of manufactured product to the Purchaser
(1) System for maintenance of records;
(m) System for handling storage and delivery; and
(n) A quality plan detailing out the specific quality control measures and Procedures adopted for controlling the quality characteristics relevant to each item of equipment furnished and/or services rendered.
The Purchaser or his duly authorised representative reserves the right to carry out quality audit and quality surveillance of the system and Procedure of the Manufacturer/'his vendors quality management and control activities.

3.7 Quality Assurance Documents

The Manufacturer shall be required to submit the following all Quality Assurance Documents as stipulated in the quality plan at the time of purchasers inspection of equipment/ material.

3.8 TYPE TESTING, INSPECTION, TESTING & INSPECTION CERTIFICATE

All equipment being supplied shall conform to type tests and shall be subject to routine and acceptance tests in accordance with requirements stipulated under respective sections. Purchaser reserves the right to witness any or all the tests. The Manufacturer shall intimate the Purchaser the detailed programme about the tests at least three (3) weeks in advance in case of domestic supplies & six (6) weeks in advance in case of foreign supplies. Purchaser reserves the option for getting any or all the type tests repeated on the equipment. The Manufacturer shall also submit type test procedure for approval of the Purchaser.

In the event of any discrepancy in the test reports i.e. any test report not acceptable due to any design/manufacturing changes (including substitution of components) or due to non-compliance with the requirement stipulated in the technical specification or any/all additional type tests not carried out without any additional cost implication to the Purchaser.

The price of conducting all tests and additional type tests is deemed to be included in Bid price. In case any bidder indicates that he shall not carry out a particular test, his offer shall be considered incomplete and shall be liable to be rejected.

The purchaser intends to repeat the type tests and additional type tests on cables for which test charges shall be payable as per provision of contract.

The Purchaser, his duly authorised representative and/or outside inspection agency acting on behalf of the Purchaser shall have at all reasonable times free access to the Contractors premises or Works and shall have the power, at all reasonable times to inspect and examine the materials and workmanship of the Works during its manufacture or erection if pert of the Works is being manufactured or assembled at other premises or works, the Manufacturer shall obtain for the Engineer and for his duly authorized representative permission to inspect as if the works were manufactured or assembled on the Manufacturer's own premises or works. Inspection may be made at any stage of manufacture, dispatch or at site at the option of the Purchaser and the equipment if found unsatisfactory due to bad workmanship or quality, material is liable to be rejected.

The Manufacturer shall give the Purchaser/inspector thirty (30) days written notice of any material being ready for testing. Such tests shall be to the Manufacturer's account except for the expenses of the inspector. Unless witnessing of the tests is virtually waived, the Purchaser/ inspector will attend such tests within thirty (30) days of the date of which the equipment is notified as being ready for test/ inspection, failing which the Manufacturer

may proceed with the test which shall be deemed to have been made in the Inspector's presence and the Manufacturer shall forthwith forward duly certified copies of test reports in triplicate to the Inspector.

The Purchaser or Inspector shall, within fifteen (15) days from the date of inspection as defined herein, give notice in writing to the Manufacturer, of any objection to any drawings and all or any equipment and workmanship which in his opinion is not in accordance with the Contract. The Manufacturer shall give due consideration to such objections and shall either make the modifications that may be necessary to meet the said objections or shall confirm in writing to the Purchaser/ inspector giving reasons therein, that no modifications are necessary to comply with the Contract.

When the factory tests have been completed at the Manufacturer's works, the Purchaser/ inspector shall issue a certificate to this effect within fifteen (15) days after completion of tests but if the tests are not witnessed by the Purchaser/inspector, the certificate shall be issued within fifteen (15) days of receipt of the Manufacturer's Test certificate by the Engineer/ Inspector. Failure of the Purchaser/inspector to issue such a certificate shall not prevent the Manufacturer from proceeding with the Works. The completion of these tests or the issue of the certificate shall not bind the Purchaser to accept the equipment should it, on further tests/ after erection, be found not to comply with the Contract. The equipment shall be dispatched to site only after approval of test reports and issuance of MICC by the Purchaser.

In all cases where the Contract provides for tests whether at the premises or at the works of the Manufacturer or of any Sub-Contractor, the Manufacturer except where otherwise specified shall provide free of charge such items as labour, materials, electricity, fuel, water, stores, apparatus and instruments as may be reasonably demanded by the Purchaser /Inspector or his authorised representative to carry out effectively such tests of the equipment in accordance with the Contract and shall give facilities to the Purchaser Inspector or to his authorised representative to accomplish testing.

The inspection by Purchaser and issue of Inspection Certificate thereon shall in no way limit the liabilities and responsibilities of the Manufacturer in respect of the agreed quality assurance programme forming a part of the Contract.

The Purchaser will have the right of having at his own expenses any other test(s) of reasonable nature carded out at Manufacturer's premises or at site or in any other place in addition of aforesaid type and routine tests, to satisfy that the material comply with the specification.

The Purchaser reserves the right for getting any field tests not specified in respective sections of the technical specification conducted on the completely assembled equipment at site. The testing equipment for these tests shall be provided by the Purchaser

3.9 MATERIALS AND WORKMANSHIP

Equipment materials and components shall be new, of high grade and good quality and be to the latest engineering practice. The material and workmanship throughout shall be in accordance with the purpose for which they are intended. Each component shall be designed to be consistent with its duty.

All the information concerning materials or components to be used in manufacturing, machinery, equipment, materials and components supplied, installed or used shall be submitted for approval. Without such approval the supplier shall run risk of subsequent rejection. The cost as well as time delay associated with such rejection shall be borne by the supplier.

3.10 PACKING AND STORAGE

All the equipments shall be suitably protected, coated, covered or boxed and crated to prevent damage or deterioration during transit, handling and storage at site till the time of erection. On request of the purchaser, the manufacturer shall also submit packing details/ associated drawing for any equipment/ material at a later ate, in case the need arises. While packing all the materials, the limitation from the point of view of availability of Railway wagon sizes in India should be taken into account. The manufacturer shall be responsible for any loss or damage during transportation, handling and storage due to improper packing. Any demurrage, wharf age and other such charges claimed by the transporters, railways etc shall be to the account of the manufacturer. Purchaser takes no responsibility of the availability of the wagons.

All coated surfaces shall be protected against abrasions, impact, discoloration and any other damages. All exposed threaded portions shall be suitably protected with either a metallic or a non-metallic protecting device.

Supplier shall ensure that equipment shall be properly packed, blocked, padded, coated and protected so that it is not damaged due to possible mishandling. Storage requirements shall be clearly defined by the supplier. Packing shall be such that if required, long time storage at site should not deteriorate the performance of the equipment.

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SECTION IV

GUARANTEED AND TECHNICAL PARTICULARS OF ACSR MOOSE/BERSIMIS/ZEBRA

1.	Manufacturer's Name & address	
2.	Particulars of raw material	
2.1	Aluminium	
a)	Min. purity of aluminium	%
b)	Max. Copper content	%
2.2	Steel wires/ Rods	
a)	Carbon	%
b)	Manganese	%
c)	Phosphorus	%
d)	Sulphur	%
e)	Silicon	%
2.3	Zinc- Minimum Purity	%
3.	Aluminium Strands after stranding	
3.1	Diameter	
	a) Nominal	mm
	b) Maximum	mm
	c) Minimum	mm
3.2	Min. breaking load of strand after stranding	kN
3.3	Max. resistance of 1m length of strand at 20° C	
4.	STEEL STRANDS AFTER STRANDING	
4.1	Diameter	
	a)Nominal	mm
	b)Maximum	mm
	c)Minimum	mm
4.2	Min. breaking load of strand	Kn
4.3	Galvanizing	
a)	Min. weight of zinc coating per sq.m of uncoated wire surface	gm.
b)	Min. no. of dips that the galvanized strand can withstand in the standard preece test	
c)	Min. number of twist to be withstood in torsion test when tested on a gauge length of100 times diameter of wire	Nos.

5. ACSR CONDUCTOR

5.1	Minimum UTS	kN
5.2	Lay Ratio of conductor	
a)	Outer Steel layer	
b)	Aluminium - 12 wire layer	
c)	Aluminium 18 wire layer	
d)	Aluminium 24 wire layer	
5.3	DC resistance of ACSR at 20°C	Ω
5.4	Min. corona extinction voltage (dry)	kV
5.5	RIV at 1 MHz across 300-ohm resistor at 305 kV under dry conditions	
5.6	Standard length of conductor in one drum	m
5.7	Direction of lay for outside layer	-
5.8	Linear mass of conductor	mm
a)	Standard	kg/km
b)	Minimum	kg/km
c)	Maximum	kg/km

6. No. of cold pressure but welding equipment available at works

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SECTION V

QUALITY PLAN

Bidder shall follow standard BHEL QAP.

QUALITY PLAN

ITEM : ACSR CONDUCTOR	QP NO : TBQM-STD-ACSR REV:03 DATE :07.06.2014 Page 1 of 8	PROJECT :RATE CONTRACT PACKAGE /CONTRACT : **CONTRACTOR : BHEL**

S.NO.	COMPONENT / OPERATION	CHARACTERISTIC CHECKED	CATEGORY	TYPE OF CHECK	EXTENT OF CHECK	REFERNCE DOCUMENT	ACCEPTANC-E. NORM	FORMAT OF RECORD	D	AGENCY P	AGENCY W	AGENCY V	REMARKS
1	2	3	4	5	6	7	8	9		10	11	12	13
1.0	RAW MATERIAL ALUMINIUM WIRE ROD	i) Chemical Composition	Major	Chem.	1 sample per heat or 40 MT or part thereof	IS:4026 /Appd. Data Sheet	IS:4026/ Appd. Data Sheet	Supplier TC/ TPI Lab TC	V	M		C,N	
		ii) Dia of Al Rod	-do-	Measure	1 sample from each coil	IS:5481/ Appd. Data Sheet	IS:5481/ Appd. Data Sheet	-DO-	V	M		C,N	
		iii) Mechanical /Elec. properties a] Breaking load/Tensile Test	-do-	Mech.	-do-	-do-	-do-	Supplier TC	Y	M		C,N	
		b) Resistivity & conductivity	-do-	Electrical	-do-	-do-	-do-	-do-	V	M		C,N	
		c) Elongation	-do-	Mech.	-do-	-do-	-do-	-do-	V	M		C,N	
		iv] Cleanliness & surface smoothness	-do-	Visual	-do-	-do-	-do-	Supplier TC	V	M		C,N	
2.0	GALVANISED STEEL WIRE	i)Chem. Composition	-do-	Chemical	3 sample per heat or 40 mt or part thereof	IS:398(P-V)	IS:398(P-V)	Ins. Record	V	M		C,N	

Released for Rate Contract

LEGEND :
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N – CUSTOMER /CUSTOMER NOMINATED AGENCY
P – PERFORMED BY
W – WITNESSED BY
V – VERIFICATION BY
CHP- CUSTOMER HOLD POINT TC – TEST CERTIFICATE IR- INSPECTION REPORT
JIR – JOINT INSPECTION REPORT

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SIGN & SEAL

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QUALITY PLAN

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S.NO.	COMPONENT / OPERATION	CHARACTERISTIC CHECKED	CATEGORY	TYPE OF CHECK	EXTENT OF CHECK	REFERNCE DOCUMENT	ACCEPTANC-E. NORM	FORMAT OF RECORD		AGENCY			REMARKS
										P	W	V	
1	2	3	4	5	6	7	8	9	D	10	11	12	13
		ii) Dia of GST Wire	Critical	Measures	1 sample from each coil	IS:398(P-V) Appd. Data sheet	IS:398(P-V) Appd. Data sheet	-do-	V	M		C,N	
		iii) Breaking load/Tensile Test	-do-	Mech.	-do-	-do-	-do-	-do-	V	M		C,N	
		iv) Elongation	-do-	-do-	-do-	-do-	-do-	Test Record	V	M		C,N	
		v) Torsion	Major	Mech.	1 sample from each coil	IS: 398 (Part-V)	IS: 398 (Part-V)	Supplier TC & qc format	V	M		C,N	
		vi) Wrapping	-do-	-do-	-do-	-do-	-do-	-do-	V	M		C,N	
		vii) Preece Test	-do-	Chemical	-do-	IS:4826	IS:4826	-do-	V	M		C,N	
		viii) Weight of Zinc coating	-do-	-do-	-do-	IS-2633 IS-4826	IS-2633 IS-4826	-do-	V	M		C,N	
		ix) Adhesion Test	-do-	Mech.	10% of each coil	IS-4826	IS-4826	-do-	V	M		C,N	
		x) Check for joint	-do-	Visual	1 sample lot of	IS:6745	IS:6745	-do-	V	M		C,N	

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QUALITY PLAN

ITEM : ACSR CONDUCTOR	QP NO : TBQM-STD-ACSR REV:03 DATE :07.06.2014 Page 3 of 8	PROJECT :RATE CONTRACT
		PACKAGE /CONTRACT :
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S.NO.	COMPONENT / OPERATION	CHARACTERISTIC CHECKED	CATEGORY	TYPE OF CHECK	EXTENT OF CHECK	REFERNCE DOCUMENT	ACCEPTANC-E. NORM	FORMAT OF RECORD		AGENCY			REMARKS
										P	W	V	
1	2	3	4	5	6	7	8	9	D	10	11	12	13
		xi) Check for purity of Zinc	-do-	Chemical	50 Mt or part thereof	IS:4826 IS-398 (Pt-V)	IS:4826 IS-398 (Pt-V)	Supplier T/C or 3% party la	V	M		C,N	
3.0	IN PROCESS INSPECTION Aluminium Wire Rod	i)Surface finish & stranding	-do-	Visual	100% on each coil	IS-398 (Part-V)	IS-398 (Part-V)	QC format		M		C,N	
		ii) Dia of drawn Aluminium wire	-do-	Measure	1 sample from each coil	-do-	-do-	-do-		M		C,N	
		iii) Break loads / Tensile test	-do-	Mech	-do-	-do-	-do-	-do-		M		C,N	
		iv) Resistance	Minor	Elec	-do-	-do-	-do-	-do-		M		C,N	
		vi) Wrapping	Major	Mech.	-do-	-do-	-do-	-do-		M		C,N	
4.0	Steel Stranding	i)Lay Ratio Direction & compactness	-do-	Measure	Each length at beginning	-do-	-do-	-do-		M		C,N	
		ii) Preforming & post forming of steel core	-do-	Visual	100% on each Drum	-do-	-do-	-do-		M		C,N	

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BHEL SIGN & SEAL

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QUALITY PLAN

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		PACKAGE /CONTRACT :
		CONTRACTOR : BHEL

S.NO.	COMPONENT / OPERATION	CHARACTERISTIC CHECKED	CATEGORY	TYPE OF CHECK	EXTENT OF CHECK	REFERNCE DOCUMENT	ACCEPTANC-E. NORM	FORMAT OF RECORD		AGENCY			REMARKS
										P	W	V	
1	2	3	4	5	6	7	8	9	D	10	11	12	13
		iii) Joints	-do-	-do-	-do-	-do-	-do-	-do-		M		C,N	No Joint allowed of any kind in steel wire.
		iv) Surface Smoothness	-do-	-do-	-do-	-do-	-do-	-do-		M		C,N	
5.0	Final Conductor Stranding	i)Lay Ratio Direction & Competence	-do-	Measure	Each length at Begining	-do-	-do-	-do-		M		C,N	
		ii) Smoothness /Surface on each core	-do-	Visual	100% on each Drum	-do-	-do-	-do-		M		C,N	
		iii) Joints	-do-	-do-	-do-	-do-	-do-	-do-		M		C,N	No joint shall be permitted in the individual wire in outermost layer of finished conductor. However joints in 12 wire and 18 wire inner layer of Al. wire shall be allowed before final drawing but

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										P	W	V	
1	2	3	4	5	6	7	8	9	D	10	11	12	13
													these joints shall be made by cold pressure but welding and no such joints within 15 mtrs. of each other in other in the complete stranded conductor.
		iv) Surface cleanliness	-do-	-do-	-do-	-do-	shall be clean & free from oil & dirt	-do-		M		C,N	
6.0	**TYPE TEST CLEARENCE TO BE OBTAINED BY MANUFACTURER FROM TBEM PRIOR TO FINAL INSPECTION**												
C	FINAL INSPECTION & TESTING												
6.1	Acceptance test on finished conductor	i)Lay Ratio Direction & compactness	Major	Measure	10% of drums	IS:398 (Part-V)	IS:398 (Part-V)	JIR	V	M	C,N	C,N	CHP
		ii) Diameter	-do-	-do-	-do-	-do-	-do-	JIR	V	M	C,N	C,N	CHP

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QUALITY PLAN

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										P	W	V	
1	2	3	4	5	6	7	8	9	D	10	11	12	13
		iii) Breaking load/ Tensile Test & UTS of welded Al-strand	-do-	-do-	-do-	-do-	-do-	JIR	V	M	C,N	C,N	CHP 2.UTS to be done on welded Al- strand in addition to other tests
		iv) DC Resistance	-do-	Elect.	-do-	-do-	-do-	JIR	V	M	C,N	C,N	CHP
		v) Wrapping Test	-do-	Mech.	-do-	-do-	-do-	JIR	V	M	C,N	C,N	CHP
6.2	Acceptance Test on Galv. Steel wire of finished conductor	i) Diameter	-do-	Mech.	-do-	-do-	-do-	JIR	V	M	C,N	C,N	CHP
		ii) Breaking load/Tensile Test	-do-	-do-	-do-	-do-	-do-	JIR	V	M	C,N	C,N	CHP
		iii) Elongation	-do-	-do-	-do-	-do-	-do-	JIR	V	M	C,N	C,N	CHP
		iv) Torsion	-do-	-do-	-do-	-do-	-do-	JIR	V	M	C,N	C,N	CHP
		v) Wrapping Test	-do-	-do-	-do-	-do-	-do-	JIR	V	M	C,N	C,N	CHP
		vi) Preece Test	Major	Mech	-do-	IS:4826 IS: 2633	IS:4826 IS: 2633	JIR	V	M	C,N	C,N	CHP

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पारेषण व्यापार समूह / TBG
भारत हेवी इलेक्ट्रिकल्स लिमिटेड / BHEL
5th Floor, Advant Navis IT Business Park
Sector-142, Expressway Noida-201305

QUALITY PLAN

ITEM : ACSR CONDUCTOR	QP NO : TBQM-STD-ACSR REV:03 DATE :07.06.2014 Page 7 of 8	PROJECT :RATE CONTRACT PACKAGE /CONTRACT : **CONTRACTOR : BHEL**

S.NO.	COMPONENT / OPERATION	CHARACTERISTIC CHECKED	CATEGORY	TYPE OF CHECK	EXTENT OF CHECK	REFERNCE DOCUMENT	ACCEPTANC-E. NORM	FORMAT OF RECORD	D	AGENCY P	AGENCY W	AGENCY V	REMARKS
1	2	3	4	5	6	7	8	9	D	10	11	12	13
		vii) Weight of Zinc coating	-do-	Chem.	-do-	IS:4826 IS: 6745	IS:4826 IS: 6745	JIR	V	M	C,N	C,N	CHP
		viii) Adhesion Test	-do-	Mech	-do-	IS:4826	-do-	JIR	V	M	C,N	C,N	CHP
7.0	Other Measurement	i) Check for joint	-do-	Visual	1 sample per 10 drum	IS:398(Part-V)	IS:398(Part-V)	JIR	V	M	C,N	C,N	CHP No joint shall be permitted in the individual wire in outermost layer of finished conductor
		ii) Surface finish and length measurement	-do-	Measure	-do-	Appd GTP	Appd GTP	JIR	V	M	C,N	C,N	CHP
		iii) Wooden drum	-do-	-do-	-do-	IS:1778	IS:1778	JIR	V	M	C,N	C,N	CHP
8.0	Packing & Despatch check for identification & packing	Proper packing	-do-	Visual	100%	As per BHEL SPEC.	AS PER BHEL SPEC	Desp. Format		M		C,N	
		ii) Mfg. Name	-do-	-do-	-do-	-do-	-do-	-do-		M		C,N	
		iii) Size & code	-do-	-do-	-do-	-do-	-do-	-do-		M		C,N	
		iv) Gross Weight	-do-	-do-	-do-	-do-	-do-	-do-		M		C,N	

LEGEND :
M – SUPPLIER / SUB SUPPLIER
C - BHEL / NOMINATED INSPECTION AGENCY
N – CUSTOMER /CUSTOMER NOMINATED AGENCY
CHP- CUSTOMER HOLD POINT
JIR – JOINT INSPECTION REPORT
P – PERFORMED BY
W – WITNESSED BY
V – VERIFICATION BY
TC – TEST CERTIFICATE
IR- INSPECTION REPORT

दिप्तोजित सेनगुप्ता / DIPTOJIT SENGUPTA
अभियंता (गुणवत्ता) / Engineer (Quality)
पारेषण व्यापार समूह / TBG
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SIGN & SEAL

APPROVED BY
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										P	W	V	
1	2	3	4	5	6	7	8	9	D	10	11	12	13
		v) Total weight	-do-	-do-	-do-	-do-	-do-	-do-		M		C,N	
		vi) Net weight	-do-	-do-	-do-	-do-	-do-	-do-		M		C,N	
		vii) Length of Conductor	-do-	-do-	-do-	-do-	-do-	-do-		M		C,N	
		viii) Paint Coating	-do-	-do-	-do-	-do-	-do-	-do-		M		C,N	

Note:-

1. Supplier shall directly submit and obtain SMQP approval from PGCIL,QA & I deptt & same shall be applicable to PGCIL projects.
2. For NTPC, NPCIL & similar customers[where supplier MQP is required], supplier shall submit to BHEL & approval of customer shall be obtained.
3. For all other projects where the item is classified under inspection Cat-B of approved inspection category list, this QP shall be applicable.

Diptojit

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