

10.01.2022

Corrigendum No. – 1

Tender Enquiry No- TPSODL/OT/2021-22/083

Work Description – Rate Contract for supply of FRP TELESCOPIC DISCHARGE ROD 11 – 33kV at TPSODL.

The Technical specification provided in the tender document is here by revised. The revised technical specification is enclosed for your reference.

Encloser: -

Revised Technical specification for FRP TELESCOPIC DISCHARGE ROD 11 – 33kV.


Regards

Web www.tpsouthernodisha.com

TP SOUTHERN ODISHA DISTRIBUTION LIMITED
(A Tata Power and Odisha Government Joint Venture)

Courtpeta | Berhampur | Ganjam | Odisha - 760 004

Note-This document does not require signature


	TP SOUTHERN ODISHA DISTRIBUTION LIMITED, BERHAMPUR	
	TECHNICAL SPECIFICATION	
Doc. Title	SPECIFICATION FOR DISCHARGE ROD UP TO 66 KV	
Doc. No	ENG-GEN-Discharge Rod upto 66kV	Eff. Date: 01/03/2021
Rev. No	00	Page 1 of 9
Prepared by: Ranjan Kumar Sahoo	Reviewed By: Priya Kumar Sharma	Approved & Issued By: Mahendra Kumar Pandey

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1.0	SCOPE	This specification covers technical requirements of design, Constructional features, Inspection, testing, Supply & transportation of Discharge Rod up to 66kV voltage grade at TPSODL stores/site.	
2.0	APPLICABLE STANDARDS	‘Discharge Rod’ covered by this specification shall unless otherwise stated, be designed, manufactured and tested in accordance with latest revisions of relevant Indian Standards /IEC/ International Standards and shall conform to the regulations of local statutory authorities.	
		IS 2071: Part II	Methods of High Voltage Testing - Part II : Test Procedures
		IS 16622:2019	Live working-insulating hollow tubes for electrical purpose
		IS: 11731(Part-II)-1992	Methods of test for determination of Flammability of solid electrical Insulating materials when exposed to an igniting source
		IEC 61230	Live working – Portable equipment for earthing or earthing and short circuiting
		IEC 61138	Cables for portable earthing and short-circuiting equipment
		IEC 60060-1	High voltage test techniques
		IEC 61235-1995	Live working -Insulating hollow tubes for electrical purposes
		<i>*In case of any conflict on any technical particular in the specification, the stricter requirement mentioned in the relevant standard shall be valid.</i>	
3.0	CLIMATIC CONDITIONS OF THE INSTALLATION	<p>The material shall be suitable for following climatic conditions,</p> <ol style="list-style-type: none"> Maximum altitude above sea level 1,000m Maximum ambient air temperature 50°C Maximum daily average ambient air temperature 35°C Minimum ambient air temperature 0°C Maximum relative humidity 95% Average number of thunderstorm days per annum (isokeraunic level) 70 Average number of rainy days per annum 120 Average annual rainfall 150cm Earthquakes of an intensity in horizontal direction - equivalent to seismic acceleration of 0.3g Earthquakes of an intensity in vertical direction - equivalent to seismic acceleration of 0.15g (g being acceleration due to gravity) 	
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4.0

GENERAL
TECHNICAL
REQUIREMENTS

11 .Wind velocity: 300 km/hr, 200 km/hr and 160 km/hr.


Environmentally, some of the regions, where the work will take place includes coastal areas, subject to high relative humidity, which can give rise to condensation. Onshore winds will frequently be salt laden. On occasions, the combination of salt and condensation may create pollution conditions for outdoor insulators. Some places are in heavily industrial polluted areas.

Therefore, Outdoor material and equipment shall be designed and protected for use in exposed, heavily polluted, salty, corrosive and humid coastal atmosphere

The design of equipment and accessories shall be suitable to withstand seismic forces corresponding to an acceleration of 0.1 g.


S.No.	Description	Requirement
1.	system voltage	Upto 66 KV
2.	Class of insulation of insulated Rod & extension handles	'F' class. Pultruded fibre glass with antistatic coating and the insulated pole should be free from scratches or mechanical damages.
3.	Total length of Discharge rod	13 mtr. (Min) in 3 fold
4.	Insulated operating Rod tentative sizes for main rod and Extension rods with overlapping adaptor (The operating rod outer diameter below 35mm as per IS 16622 can be considered if found suitable after demo of sample)	Main Rod :
ID : 25mm ± 1mm		
OD : 31mm ± 1mm		
LENGTH : 1.5 to 2 meter		
Extension Handles :		
ID : 25mm ± 1mm		
OD : 31mm ± 1mm		
LENGTH : 1.5 to 2 meter		
Overlapping Adaptor		
ID : 30mm ± 1mm		
OD : 37mm ± 1mm		
LENGTH : 190mm (each)		
5.	Main discharge head	<div><div>1.</div><div>MS Hard chrome plated with link hook. This is fitted on the main insulated pole of discharge rod.</div></div> <div><div>2.</div><div>It should be non-removable type and riveted on the rod like a cap on rod.</div></div> <div><div>3.</div><div>Top surface shall have provision for fixing either discharge register or discharge hook one at a time necessary threading arrangement to be provided.</div></div> <div><div>4.</div><div>The top head shall be provided with a bolt for fixing of discharge cable lug on top surface when direct link hook used for discharge.</div></div> <div><div>5.</div><div>The head shall have minimum 40mm side extended link hook on head.</div></div>

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		6.	Attachment of extension handles	<p>1. The main rod and extension handles are provided with snap pins with spring to easily connect and remove extension handle.</p> <p>2. The snap pins and it's spring shall be made up of stainless steel to maintain its spring action for long time with two locking heads in 180° opposite.</p>
		7.	Discharge hook	Rounded hook should be of 4 inch dia Hook material shall be Tin plated copper rod of ½ inch dia of electrical grade. The hook is heat treated to retain its shape for long time. The hook shall be removable.
		8.	Discharge resistor	Non linear carbon film discharge resistor (heavy duty) for controlled discharging of equipment like transformers, reactors, cables, high capacity machines and transmission lines. The resistor can be detached by unscrewing. the discharge resistor must have inverse temperature characteristics which
				facilitates controlled discharging resistance value : approx. 7 to 10k ohms
		9.	Earthing cable	The earthing lead shall have Lug at both ends. Lug shall be pressure crimped & brazed on both ends. Heat shrinkable sheath to be provided at the joints to protect moisture from penetrating into lead.
		9.1	Cable Conductor	Flexible copper (electrical grade)
		9.2	Conductor size	35 sqmm
		9.3	Conductor resistance	To be provided by bidder
		9.4	Diameter of conductor	To be provided by bidder
		9.5	Insulation material of conductor	PVC , ST-1 (–20 °C to + 70 °C)
		9.6	Thickness of PVC insulation of conductor	1.2 mm
		9.7	Color of PVC insulation of conductor	Transparent
		9.8	Overall diameter	Must be provided by bidder
		9.9	Length of cable	12 meter
		10.	Earth end clamp	Made from high strength special aluminium alloy. maximum opening 25mm maximum clamping depth : 2" Size and dimension shall be as per type tested design during short circuit test.
		11.	Duty	Whole system is designed to withstand high fault currents up to min. 8KA for 1 sec or min.11.3 KA for 0.5 sec (as per IEC 61230).
		12.	Anti tracking system	The insulated rod is provided with 2 coats of anti-tracking compounds. saline treated epoxy glass, 'f' class form the main insulation
		13.	Surface finish and texture	The surface finish of the insulated stick must be highly glossy & fine so that minimum dust or moisture may deposit on it.

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		14.	Interchangeability	Insulated rods have interchange-ability among themselves. The coupling arrangement shall be such that any extension rod can be fitted in any main rod, Without any sequence.
		15.	Carrying cases	Nylon Carrying cases to be provided for carrying & storage of 1. discharge rods and extensions 2. earthing cable and accessories.
		16.	BDV of the discharge rod material	8-12 kV /mm
		17.	Dielectric strength	The insulated rod of discharge rod must conform to minimum dielectric withstand strength of minimum 100kV/feet.
		18.	safety rain guard/safety stopper for protection	Must be provided on main rod.
5.0	GENERAL CONSTRUCTION	<p>Earthing Discharge Rods is an insulated rod, usually made of fiberglass with extension handle. Discharge Rod complete with accessories suitable for 11KV, 33KV and 66KV system voltage for discharging dead conductors /busbars.</p> <ol style="list-style-type: none"> The discharge rod shall be made from Glass Fibre Epoxy insulation manufactured through pultrusion process. The Insulating Rod shall be light in weight and has high mechanical strength and good electrical properties. The main rod and extension handles are provided with snap pin with spring to easily connect and remove the extension handles. The snap pins and spring shall be made from high grade stainless steel to maintain its spring action for long time. The main insulated rod shall be provided with safety rain guard/safety stopper for protection. The Safety stopper must be flexible type to avoid breakage in case of the insulated rod is dropped. The surface finish of the insulated rod must be highly glossy and fine so that minimum dust or moisture may deposit on it. 		
6.0	NAME PLATE AND MARKING	<ol style="list-style-type: none"> Following details shall be embossed/marked on Discharge rod: <ol style="list-style-type: none"> Manufacturer's name month and Year of manufacturing (MM/YYYY) RO/PO No. Property of PROPERTY OF TPSODL Following details shall be embossed/ printed on the earthing cable : <ol style="list-style-type: none"> Manufacture Name, size , standard ISI Mark 		

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7.0

TESTS

Routine, Acceptance & Type tests shall be carried out in accordance with the relevant IS/IEC/ International standard. Acceptance tests shall be witnessed by TPSODL authorized representative. Following tests shall be necessarily conducted on the **discharge rod** in additions to others specified in IS/IEC/ANSI standards. Type tests shall be conducted from CPRI/ERDA only.

**In case of any conflict on any technical particular in the specification, the stricter requirement mentioned in the relevant standard shall be valid.*

(A) Type Tests


S No.	Tests	Clause no.	Reference Standard
1	Visual Inspection	Clause 8.1 of IS 16622	IS 16622 : 2019 IEC 61235 : 1993
2	Dimension Check	Clause 8.2 of IS 16622	IS 16622 : 2019 IEC 61235 : 1993
3	Dielectric test before and after exposure to humidity	Clause 9.1 of IS 16622	IS 16622 : 2019 IEC 61235 : 1993
4	Dielectric wet test	Clause 9.2 of IS 16622	IS 16622 : 2019 IEC 61235 : 1993
5	Bending Test	Clause 10.1 of IS 16622	IS 16622 : 2019 IEC 61235 : 1993
6	Torsion Test	Clause 10.2 of IS 16622	IS 16622 : 2019 IEC 61235 : 1993
7	Crushing Test	Clause 10.3 of IS 16622	IS 16622 : 2019 IEC 61235 : 1993
8	Impulse Voltage Withstand Test at 170KV	IS 2071	IS 2071
9	Short Circuit Withstand Test for high fault levels for cable with earthing clamps	AS per IEC 61230	AS per IEC 61230

(B) Routine Tests and Acceptance Tests:

All acceptance tests mentioned below shall be witnessed by TPSODL's representative during inspection stage.


Sr. No.	Tests
1	Visual inspection
2	Dimensions check
3	Dielectric test – On each section of operating rod subject to 100kV AC RMS, with leakage current less than 50micro Amp
4	Fitment and interchangeability check for extension rods.
5	Fitment of capsule, hook, earthing cable and connection clamps

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8.0	TYPE TEST CERTIFICATES	<p>Bidder shall furnish the type test report of discharge rod for the tests as mentioned in Clause no. 7 of this specification and as per reference standards.</p> <p>Test Laboratories: Complete set of Type Tests shall be conducted at certified test laboratories, which are CPRI / ERDA only.</p> <p>Type test report shall be submitted for the discharge rod mentioned in the bid/ OR for any size higher (than required) of similar type and similar or higher voltage grade. Type test should have been conducted in certified test laboratories during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test reports i.e. any test report not acceptable or any/all type tests (including additional type tests, if any) not carried out, same shall be carried out without any cost implication to TPSODL.</p>
9.0	PRE-DISPATCH INSPECTION	<p>Inspection shall be carried out by duly authorized representative of TPSODL. Bidder shall grant free access to the places of manufacture to TPSODL's representatives at all times when the work is in progress. Inspection may be made at any stage of manufacturing at the discretion of TPSODL and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Inspection by TPSODL or its authorized representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications.</p> <p>Dispatch of material: Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPSODL.</p> <p>Following documents shall be sent along with the supplied material:</p> <ol style="list-style-type: none"> Test reports MDCC issued by TPSODL Invoice in duplicate Packing list Delivery Challan
10.0	INSPECTION AFTER RECEIPT AT STORES	<p>The material received at TPSODL store shall be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection.</p>
11.0	GUARANTEE	<p>Requirement: Bidder shall confirm for guarantee towards design, material, workmanship & quality of process / manufacturing for integrated product delivered under the contract. In the event any defect is found by TPSODL, up to a period of at least 12 months from the date of commissioning or 18 months from the date of last supplies made under the contract whichever is later, bidder shall be liable to undertake to replace/rectify such defects at its own costs, within mutually agreed time frame, and to the entire satisfaction of TPSODL, failing which TPSODL will be at liberty to get it replaced/rectified at Bidder's risks and costs and recover all such expenses plus the TPSODL's own charges (@ 20% of expenses incurred), from the Bidder or from 'Security cum Performance Deposit' as the case may be.</p>
12.0	PACKAGING	<p>Rail/ Road transportation: The bidder shall ensure that the equipment covered under this specification shall be prepared for rail/road transport in a manner so as to protect the equipment from damage in transit.</p> <ol style="list-style-type: none"> Packaging shall be as per climate change perspective. TPSODL encourages to use environment friendly packaging.

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		<p>2. Each Rod shall be packed in individual package of sufficient strength to protect from moisture, dust and can be protected from damage during normal conditions.</p> <p>3. The Rod shall be packed in such a way that the Rod does not get deformed or damaged during transportation and storage.</p> <p>Note: Single use plastic not to be used for packing of the material.</p>						
13.0	TENDER SAMPLE	The bidder shall arrange to submit one sample on returnable basis OR provide an onsite demonstration of the product at TPSODL premises. The product will be qualified in technical evaluation only if demonstration is successful and the product full filling the TPSODL requirement. Bidder shall arrange to take back the sample within 14 days from placing of order OR closure of technical evaluation.						
14.0	TRAINING	Not Applicable						
15.0	DRAWINGS AND DOCUMENTS	<p>A. Following documents shall be submitted along with the bid:</p> <ol style="list-style-type: none"> 1. Completely filled-in clause wise compliance of the specification. 2. Type test Certificates for each specified test 3. Drawing of Discharge rod with earthing clamps 4. Judiciously filled format "check list to submit bid document" <p>B. Following documents shall be submitted after the placement of RC/PO:</p> <ol style="list-style-type: none"> 1. Completely filled-in clause wise compliance of the specification. 2. Type test Certificates for each specified test if not submit during technical evaluation 3. Drawing of Discharge rod with earthing clamps 4. Compliances of undertaking submitted during Technical Evaluation <p>All the Documents and Drawings shall be in English Language.</p>						
16.0	GUARANTEED TECHNICAL PARTICULARS	Bidder to submit clause wise compliance.						
17.0	SCHEDULE OF DEVIATIONS	<p style="text-align: center;"><u>(TO BE ENCLOSED WITH TECHNICAL BID)</u></p> <p>All deviations from this specification shall be set out by the Bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications.</p> <table border="1"> <thead> <tr> <th>S.No.</th><th>Clause No.</th><th>Details of deviation with justifications</th></tr> </thead> <tbody> <tr> <td> </td><td> </td><td> </td></tr> </tbody> </table> <p>We confirm that there are no deviations apart from those detailed above.</p> <p style="text-align: center;">Seal of the Company</p> <p style="text-align: right;">Signature : Designation</p>	S.No.	Clause No.	Details of deviation with justifications			
S.No.	Clause No.	Details of deviation with justifications						

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ANNEXURE – I
INSPECTION TEST PLAN

S No.	PARTICULARS	Specified Value	Reference documents	Test Results	Pass/Fail
1	Visual Inspection	As per specification and IS	IS 16622 : 2019 IEC 61235 : 1993		
2	Dimension Check	as per Cl.no.4 and 5 of specification and CAT-A approved document	IS 16622 : 2019 IEC 61235 : 1993		
3	Marking check	as per Cl.no.6 of specification	Cl.no.6 of specification		
4	Fitment and interchangeability check	Fitment and interchangeability check for operation	Cl.no.5 of specification		
5	Dielectric Test – On each section of operating rod	Dielectric Test – On each section of operating rod subject to 100kV AC RMS, with leakage current less than 50micro Amp.	IS 16622 : 2019		
6	Fitment of capsule, hook, earthing cable and connection clamps	As per specification			

PURCHASER'S OFFICER

BIDDER'S REPRESENTATIVE

DATE OF INSPECTION

Initiator		HOG (ENGG)	
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