

Research Designs & Standards Organisation(Traction Installation Directorate)

REASONED DOCUMENTS FOR Specification No. TI/SPC/OHE/MCS/0150 Rev.1 of MODULAR CANTILEVER SYSTEM (MCS) FOR 25 KV AC TRACTION in overhead conductor which was uploaded for 30 days on RDSO website for comments and suggestion. Following are the RDSO remarks on the comments received from manufacturers/firms.

Reasoned Document

Clause No.	Uploaded Specification No.	M/s Raychem RPG Pvt. Ltd. Vide Letter,sno.NILdt.21.09.2020	RDSO's Remark
1.1	In 25kV Over Head Traction System, bracket assembly supports both the main conductors and is more or less pivoted to the structures, capable of swiveling along the track as well as adjustable in transverse direction. This assembly holds the 65 sq. mm (diameter: 10.5 mm)/125sq. mm (diameter: 14.7 mm)/ Cadmium Copper Catenary (1000/1200/1500 kgf tension) and 107/150 sq. mm. hard drawn Copper Contact Wire (1000/1200/ 1500 kgf tension) in simple polygonal design (drawings attached as Annexure -I). A schematic diagram of bracket assembly is placed at Annexure-II.	For the different types of catenary & contact wire configuration(cross-sections) & tension requirement, loading characteristics of the MCS vis-à-vis of OHE changes. Providing a single/ generalized design configuration that fits for all could be an over-designed and overweight for other configurations where the cable cross sections requirements are lesser, say in the case of tram lines, metros etc. It is therefore recommended to categorize the requirement as per loading requirement of OHE and general requirements then can be released.	Accepted ,Para no 1.1 of the specification has already been modified to introduce three type of the cantilever design depending on the tension in the conductor and size of the conductor.
1.5	Modular Cantilever System shall be Light Weight and capable for use with trains speed up to 200 kmph. In this regard Manufacturer shall submit the certificate.	RDSO may put more details on sources for conducting test for certification. RDSO shall specify the standard permissible displacement for 200 kmph speed. Manufacturer shall submit detailed dynamic analysis of MCS, complying these requirements.)	Partially accepted . In clause no 1.5 of the specification. In this regard "manufacturer shall submit the certificate " para is deleted from the specification because there is no certifying agencies for certification of suitability of MCS for particular speed.
3.0 (ix)	Altitude - 2500m above mean sea level. 2500m above mean sea level.	There will be slight changes in electrical characteristics of the insulator (like creepage distance, break down level and clearance), while impact of altitude on mechanical properties might not be significant. It is therefore suggested to put those details for compliance.	Accepted, The Para 3.0 (ix) has been modified as below in the specification. " Altitude - 1000m / Above 1000m . The Electrical Parameters above 1000 meter altitude are increased due to changes in Environmental conditions with change in altitude. Therefore, for higher altitude, Insulators shall be designed considering altitude correction factor for Electrical parameters in line with the stipulations given in IEC: 60071-2. This is to be kept under consideration by insulator manufacturer while finalizing the design of new insulator for working in higher altitude i.e. more than 1000 meter."

4.7	The MCS shall be suitable for maximum tension length 1500 m of overhead equipment. An anti-creep is provided at middle of the tension length.	This statement needs a slight correction. ATD shall be suitable for tension length of 1500 m and MCS shall be suitable for span length 72 m. Also, it is recommended to mention the minimum length as well.	Not Accepted : Minimum tension length can not be specified. It is vary as per site condition. Anti- creep is provided at middle of the tension length in specification, hence the MCS design should have provision to hold the anticreep wire.
4.12	b) Stay Tube, Bracket Tube, Register Arm Tube and Bent Steady Arm shall fulfil design requirements. The tube shall be of the size such that the ratio of combined bending & axial	This particular requirement needs to be explained with an example of current design/ any reference from literature and its significance can be described for clear understanding. It is suggested to	Accepted : Modification has been changed in clause no. 4.1.2 of the specification.

	stresses shall be < 1.	<p>use latest and advance method of FEA computation which is being used worldwide.</p> <p>This method should be replaced (or an alternate should be given) by advanced computation and analysis techniques for safer design which generally uses Von-mises yield criterion for failure. Manufacturers can be asked to produce the static and dynamic load analysis of the new design of MCS.</p> <p>Please note that the above listed criterion has been set for the keeping minimum bending in the MCS for combined loading where all the members of the assembly take more axial compared to bending load i.e. in existing cantilever assembly.</p> <p>It is to be noted that RDSO is seeking for new vendors to develop the new product with the same specification under the Expression of Interest doc. It is therefore, the loading criterion can be based on von mises stress criteria as different designs have different loading distributions, under the given conditions.</p>	
		<p>PPS International Ltd. Vide Letter,s no. PPS/RDSO/MCS/21-21/03 Date: 04.02. 2021</p>	
		NIL comment	