

Reasoned documents on draft specification No. TI/SPC/PSI/ISOLTR/0200 for the comments

Sub: Reason document for draft specification of 25KV Motorized/Manual operated and 66KV/110KV/132KV/220kV KV Manual operated Single Pole, Double Pole and Triple Pole Isolators For Railway Electric Traction (uploaded on RDSO's website for comments)

1. The Draft specification of Isolators was uploaded on RDSO website on 24.12.2020 for comments (for 30 days). Same was emailed to CORE approved Isolators manufacturers and Zonal Railways.
2. The comments have been received from Three (03) manufacturers on draft specification.
3. As per clause no.4.4 of RDSO ISO Document no. QO-D-8.1-2 Ver. 1.2, "The concerned personnel of directorate shall prepare a document containing all suggestions and comments and also record reasons for accepting / rejecting the same. Based on the accepted changes, the draft specification shall be modified. Such specifications shall be watermarked FINAL DRAFT on every page, to prevent the same from being used inadvertently."
4. As per clause no. 4.5 of RDSO ISO Document no. QO-D-8.1-2 Ver. 1.2, "The copy of the Final draft specification and the reasoned document shall be put up on the website, after approval of the directorate head, for at least 15 days. The final draft specification displayed on website shall also be emailed to all the existing approved sources for comments and suggestion."

Based on the comments received and accepted changes thereon, the draft specification is to be modified. Comments along with reason for accepting / rejecting are tabulated below

Clause No.	Description	suggestions and comments			reasons for accepting / rejecting
		M/s Electrolite	M/s Transelectric	M/s Trittech	
4.1 Table point No. 11	Rated Lightning Impulse mentioned 250kVp/290kVp	Rated Lightning Impulse mentioned 250kVp/290kVp it should be 190kVp /240kVp as per amendment Slip letter No. TI/PSI/25ISO/POLICY/99 Dated: 03.06.1999			May not be accepted The values mentioned are as per IEC-60071 & 62505
Table point No. 12	Rated short time with stand current. for Three second	Isolator 66kV /110kV/132kV/220 kV STC rating should be 31.5KA /1 Sec . instead of 3 Sec. we have already done as per previous spec. 1 Sec for all the ratings			May not be accepted As per previous spec. of HV isolators it is for 1 Sec. However for 25 kV side Isolators it is for 3 sec. It should be retained as it is as reduction in this value will have effect on the reliability of the isolator.
4.2 & Table Point No. 5	Rated short time with stand current. for Three second	Same comment as per above			Same as above
5	<p>i) The isolator, single/double/triple pole shall be supplied fully assembled on a suitable rigid frame. For double/triple pole isolators, the cross channels for mounting, shall also form part of supply.</p> <p>x) The Operating pipe shall not have any joint and shall be supplied with four guides unless otherwise specified in the purchase order. The operating pipe shall be obtained only from approved manufacturers,</p>	<p>Point No. i) "Isolator should be fully assembled with the cross channels for mounting, shall also form part of supply". But practically speaking, it should be part of structure supplier</p> <p>Point No. x) Required operating pipe without joint but in case of 8.6mtr pipe, there is constant issue in supply, logistics as well as galvanising. Request</p>			<p>May not be accepted</p> <p>The structure supplier, supplies general structure only. Mounting arrangement is different for different equipment, hence mounting channels should be part of supply.</p> <p>Maybe accepted</p> <p>It may be convenient to store in switching stations and also convenient to supplier.</p>

	a list of which may be obtained from CORE/ALD	if pipes with flange type joints are allowed where pipes can be joint with each other with a flange to flange connection. It doesn't harm the operation and makes logistics and supply very easy. It will help in delivering quicker. We have already given such pipes in DFCC projects more than 200 sets.	FITTINGS) it is mentioned that Length of G.I Pipe is between 4 mtr. to 7 mtr. but all CORE approved manufactures supply G.I pipe of maximum length 6 mtr.		
5.3	Operating mechanism iv. The isolator shall be supplied with operating pipe in exact length for the particular mast/structure, the length being obtained from the purchaser for each type of mast/ structure.		According to our drawing the length of GI. Pipe is of 8 mtr, since full length pipe of 8 mtr. is not available from the approved manufacturers so we supply the same in two pieces as per requirement of client and provides heavy socket and flanges to connect both the pipes. In this scenario you are requested to consider this point as to supply of Operating pipe without any joint		Maybe accepted This is the repetition of Para X of 5.0. Hence maybe deleted,
5.3	There should be two separate Control box, One for Local Operation and other for Remote Operation	Point No. xii- G) Operating mechanism, they required two separate box one for control box and another one for remote control. Need better clarity on this as so far remote control has been inbuilt as NO+NC input / output in the same box without any issue.			Two separate Control box One for Local Operation and other for Remote Operation required. The Control box for Local Operation is situated/available at Isolator whereas the other control box to be used for remotely operation (e.g. it may be used by station master for isolators used at switching station, near station area) for more clarity ' applicable for Motorized Isolator only ' added
7.10.2	The mass of zinc coating shall be not less than 610 g/m ²	Mass of zinc coating shall be not less than 610gm/m ² for all ferrous parts as per RDSO Spec ETI/OHE/13 but as per amendment as slip no. 3 as per enclosed herewith GI tupe/Pipe mass of zinc coating			Maybe a accepted In compliance to amendment slip no. 3 of RDSO Spec ETI/OHE/13

		allowed upto 425gm/m2.			
3.0	List of Related Specification 11. ETI/OHE/18		This ETI/OHE/18 specification has been superseded by RDSO Spec. No. TI/SPC/OHE/FASTENERS/0120. Kindly amend it		Maybe accepted Spec. No. TI/SPC/OHE/FASTENERS/0120 is latest spec. for steel fasteners and stainless steel fasteners
5.0	DESIGN AND CONSTRUCTIONAL FEATURES (ii) The blades of the isolator shall be of electrolytic high conductivity copper with the ends silver plated (min. thickness 10 microns) and of adequate strength and cross section to IS: 191 – 2007		Maintaining of 10 micron of Silver plating is technically very steep challenge for MSME set up of which we are belongs to. More over 10 Micron silver plating on Copper tube surface often gets harden and gets removed as a thin outer covering i.e. peeled off. Moreover it incurred a substantial amount of cost incresement of Isolator. As such please reconsider the point as to 10 micron plating. You are requested to reconsider this point.		May not be accepted 10 micron of Silver plating is not newly introduced for this item and the same is being supplied to Railways since long back
5.1	Main contacts ii. The contact of the isolator shall be in the form of reverse loop so that during passage of short circuit current they exert additional pressure on the moving contacts.		Our design of main switch contacts in 25KV 1250 A and 1600A are in form of CLAMP type contact and the same is approved by CORE, Allahabad vide our drawing no. TE/96-W/492/1, TE/96-W/491/1, TE/W-96/1600/1, TE/W-96/1600/2. As such this clause of making contact in form of Reverse loop mandatory shall invalidate our CORE approved design of 25kv Isolators. You are requested to look in the clause and Clamp type contact may kindly be added in the clause to the extent of 25 KV Isolator only.		May not be accepted This is a vendor specific problem
5.2	Earthing Switch iii. The fixed contacts shall be identical to the main isolator fixed contacts except for silver plating.		In the CORE approved drawings of Earth switch for 25KV/132KV/220kv Isolator, Earth switch contact is not identical as Main switch contact. Drawing No. TE/96-W/492/1, TE/96-W/491/1,		May not be accepted This is a vendor specific problem

			TE/W-96/1600/1, TE/W-96/1600/2, TE/DRG/PSI/25-3150/ISOL/TE/ 30576/00, TE/W-86/600 A and TE/W-601 A, TE/W-92/600 A and TE/W-600B, TE/W-96/220/DP/1A Rev 1 and TE/W-96/220 /DP/1B Rev 1 and TE/W-601A, TE/W-92/220/1A Rev 1 and TE/W-92/220/1 Rev . As such this clause shall invalidate our RDSO approved design. As per drawing, same section of copper is used but the length is not same. You are requested to look in to the clause		
5.3 Operating mechanism	XII) (C) The motor drive unit shall be installed in a weather and corrosion proof, adequately ventilated cubicle made of sheet steel not less than 2 mm thick with adequate stiffeners to prevent deformation during transit and handling. The cubicle shall have a sloping roof. To prevent condensation of moisture in the cubicle, metal clad space heater, controlled by an associated thermostat and switch, shall be provided.		The clause is silent in respect of the coating & Ingress Protection of the mechanism box. Kindly give direction whether it shall be Galvanised or powder coated paint or stainless steel of Ingress Protection i.e. IP 65. Kindly give your views .		May be accepted it should be powder coated paint (Galvanised in case of coastal areas) and Ingress Protection of IP 65.
5.9	Arcing Horn:- The single pole isolator shall be provided with arcing horns which shall be of bright steel to Gr. 20- C-8 of IS : 1570 (Pt. II)		Bright steel become very Hard & weak after galvanization, which may tends to break. So we suggest you to consider mild steel in place of bright steel for Arcing Horn of Isolators.		May not be accepted Suggestion is Ok but Railways didn't complain about such issue.
4.1.12 & 13	Rated short time with stand current. for Three second (Both for main & earthing switch) & Rated peak withstand current (both for main and earthing Switch)			- Feeding system of 55/66/110/132/220 kV is having fault level of 31.5 kA with rated peak of 80 kA. - Additional transformer & cables are added in 25 kV system, due to additional impedances	May not be accepted The 2000A isolator will be used in 2x25 kV (new system) and 3150A isolators are used in Mumbai area, where the fault level is higher.

				are added, the actual fault level at 25 kV system is expected to be 20 kA as specified in case of 1250/1600A. - For additional rating of 2000/3150A isolators the fault level shall be in the range of 20 kA only. Kindly review & update.	
4.1.14	Temperature Rise			As per IEC-62271-1 temperature rise permitted for silver plated contacts is 75°C above ambient of 40°C. Kindly review & update	Maybe accepted As per Table-14 of IEC-62271-1
4.1.15	Operating Mechanism			Operating mechanism for 55 kV to 220 kV isolators - Reduction gear for mains - Manual operated for earth switch Please add in table.	Maybe accepted For better clarity
4.2.5 & 6	Rated short time with stand current. for Three second (Both for main & earthing switch) & Rated peak withstand current (both for main and earthing Switch)			Same as above clause no. 4.1.12 & 13	Maybe accepted Logically it is correct
5.0. i	The isolator shall be robust in construction and so engineered as to ensure smooth operation at all times. The isolator, single/double/triple pole shall be supplied fully assembled on a suitable rigid frame. For double/triple pole isolators, the cross channels for mounting, shall also form part of supply			Generally, railway contractors order only metallic for all isolators from isolator manufacturers. The support structure are outsource from RDSO approved vendors. Hence it is preferable to include channels for mounting operating mechanism in the scope of contractors only. The part clause "the cross channel for mounting shall also form part of supply" may be deleted.	May not be accepted The structure supplier, supplies general structure only. Mounting arrangement is different for different equipment, hence mounting channels should be part of supply.
5.2. i	The earthing switch shall be manually/motorized operated as the case may be			The earthing switch shall be : - Manually/ motorised operated for 25 kV isolators	Maybe accepted It is already mentioned that "the case may be"

				- Manually operated in case of 55 kV to 220 kV isolators Kindly review & update	
5.3. v	Operating mechanism shall be provided with a sealed type reduction gear unit so as to facilitate easy operation and maintenance of the isolator			The operating mechanism shall be provided with sealed type reduction gear unit for 55 kV to 220 kV isolators. Kindly review & update.	Maybe accepted For more clarity
5.3. x	The operating handle of the isolator shall be so designed as to work in the vertical plane. The isolator shall close when the handle is moved upwards. The free end of moving contact shall be fully housed in the fixed contact when the handle is moved fully upward in which position the isolator can be locked			This clause is applicable only for 25 kV isolators	Maybe accepted For more clarity
5.3. xii. d	The top of the cubicle shall be at a height of about 1.5 m from the rail level. The cubicle shall be so positioned that the hinge of the operating handle - for manual operation - is at a height of about 1.1 m from the rail level.			The top of the cubicle shall be at height of about 1.5 meter above the rail level may be deleted and only "the cubicle shall be so positioned that the hinged of the operating handle for manual operation is at height of about 1.1 meter from the rail level", may only be retained. Kindly review & update.	Maybe accepted The aim is to provide operating handle at convenient height for operation
5.3. xii. e	The isolator and its control circuit shall be designed for operation from the remote control center (RCC) by the traction power controller (TPC) as well as from the isolator cubicle. Local/remote spring-loaded switch as well as necessary terminations for tele-signals and tele-commands from and to the isolator- for operation from the RCC- shall therefore be provided in the isolator cubicle. The isolator cubicle shall be provided with motor protection relays.			The cubicle shall be provided with overload protection relay to be specific.	May not be accepted 'provided with motor protection relays' covers all kind of protection
5.6	The support and operating rod insulators shall be of solid core/composite type in accordance with the latest specification of RDSO viz No. ETI/OHE/15 (9/91) with A&C Slip No.1 to 6 or composite type as per RDSO			RDSO specification ETI/OHE/64 may be corrected instead of ETI/OHE/15 and delete the composite type as per RDSO spec. TI/OHE/INSCOM/0991	Maybe accepted ETI/OHE/64 is for Post Insulator, ETI/OHE/15 is for Operating Rod Insulator.

	Spec.No.TI/SPC/OHE/INSCOM/0991 and shall be procured, if included in the order, only from the approved manufacturers as per drawings approved by RDSO				
6.2	For the purpose of acceptance, isolators shall be offered for inspection in lots containing components for not more than 50 assemblies of same type of isolators. The isolators offered for inspection shall first be routine tested by the manufacturer and defective components removed			Lot size of 50 nos. as envisaged is not justified as ordered isolators in EHV class from 55 kV to 220 kV is limited to 5 to 10 nos. only.	May not be accepted The Lot size mentioned 'not more than 50', meets the comment.
7.6. i	The mechanical endurance test shall be conducted in accordance with IS: 62271 but the number of operating cycles shall be 5000 instead of 1000 as specified therein. The condition of all parts shall be satisfactory after the test. On successful completion, the test shall be continued up to 10000 cycles to determine the weak spots			(1) This clause is ok for 25 kV isolators. (2) For 55 kV to 220 kV isolators, class M0 mechanical operation testing is good enough to cater IS-9921 testing requirement to avoid re-testing of isolators. As no. of operations in 55 kV to 220 kV are limited in number.	May be accepted partially. This clause is ok for 25 kV and 55 kV isolators, as 55 kV Isolator is also used on secondary side and frequently operated. Clause No. 6.101 of IS/IEC 62271-104 to be followed for 66 kV to 220 kV Isolators
Annexure D-1 & D-2				Provided for generalize dimensions for 25 kV isolators desired by RDSO. Either you add annexure for 55 kV to 220 kV isolators or add important dimensions details such as: - Pole spacing - Phase to phase spacing - Mounting dimensions on base frame to match with support structure - Mounting dimensions of motor operated mechanism - Mounting dimensions of reduction gear operating mechanism - Mounting details of manual operating mechanism as per RDSO support structure drawing.	May not be accepted The 25 kV system is used over Railways only, hence the generalize dimensions for 25 kV given for reference. However higher rating of Isolators are commonly used by SEBs, PGCIL and other utilities, hence details not given.