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No. EL/3.2.61/Gen. Dt. 13.02.2014

All Chief Electrical Engineers,

MODIFICATION SHEET NO. RDSO/2006/EL/ MS/0345 (REV. '1'), Dated 13.02.2014

1.0 TITLE:

Standardisation of earthing switch arrangement on 3-phase locomotives to make interchangeable of various makes of VCBs between single and 3-phase locomotives.

2.0 OBJECT:

2.1 Presently two designs viz. Secheron and AREVA T&D make VCBs are in use on conventional and 3-phase electric locomotives of Indian Railways. In conventional locomotives, the moving blades of HOM are engaged with contact clips attached with the two insulators mounted on the roof and connected to pantograph and bushing line by flexible connections.

2.2 In 3-phase locomotives, the earthing switch is the integral part of Secheron design VCB and moving blades of HOM engaged with contact clips fitted on the horizontal insulator of VCB itself. With this arrangement of earthing switch, other than Sechereon design VCBs can not be fitted on 3-phase locomotives.

2.3 CLW vide their letter No. ELDD/1501 dt. 15.03.2013 has reported clearance problem in implementation of Modification Sheet No. RDSO/2006/MS/0345 (Rev. '0') dated 08.05.2006 in 3-Ph locomotives provided with IGBT based power converters.

2.4 Problems faced by CLW in implementation of modification in 3-ph locos provided with IGBT based power converters were jointly examined by RDSO, CLW and M/s Schneider. Based on the fitment trial & type testing of the proposed modified arrangement of Schneider VCB & existing earth switch for temperature rise as well as High Voltage withstand test(Power frequency & Impulse), Rev(1) of the above modification has been finalized.

3.0 Existing arrangement with cross references of respective design document:

3.1 Existing arrangement of 3-phase locomotives for Secheron design circuit breaker and earthing switch is shown in enclosed drg, no.SKEL-4704. In this arrangement the moving blades of earthing switch are engaged with contact clips directly attached with the horizontal insulator of VCB.

3.2 Modification of earthing switch arrangement on 3-phase locomotives as per the Rev(0) of this modification is shown in drawing No. SKEL-4706.In this modification, the existing HOM was shifted by 205 mm (as per drg. No.SKEL-4706) with increased mounting collar height by 70 mm from loco roof. Additional 02 nos. roof insulators were required with attached contact clips arrangement to receive moving blades of HOM.

4.0 Modified arrangement to replace existing arrangement as given in 3.0:

Existing in-service as well as new 3-ph locomotives on which the above modification was to be implemented for interchangeability among various makes VCBs, will now be modified as per arrangement enclosed as Annexure-I. The arrangement involving Schneider make VCB & existing design earthing switch have been kept at original location(SKEL-4704). Requisite material for carrying out this modification in the existing 3-ph locomotives shall be part of scope of supply of Schneider's VCB type 22CB and Railways may approach accordingly as per their requirement. Revision(1) of the modification sheet has following features:

4.1 VCB & Earthing switch locations will remain same at their original locations of the 3-ph locomotives. The arrangement is shown in drawing No. SKEL-4704.

4.2 Provision has been made for insulating cap at lower terminal of the Schneider make VCBs type 22CB as per their drawing No.LSC:842, rev. 'A' to cater 250 mm earth clearance.

4.3 Replacement of one arm of the earthing blade of the existing earthing switch with longer arm of the earthing blade in one piece for the earthing switch as per sketch at Annexure-I is to be done by the Railways for fitment of Schneider make VCBs.

4.4 Arrangement will provide interchangeability with other make VCBs. Only one arm of the earthing switch required to be changed during change of Secheron design VCBs(AAL & BTIL) with Schneider make VCB and vice-versa.

4.5 Copper connections along with jaw contacts have provision of enlarged holes for mounting finger contact for better alignment of earthing contacts has been provided(Annexure-I, Point 2). Additional holes have also been provided in the incoming & outgoing copper connections for flexibility in connections.

4.6 Single bottle VCB type 22CB of M/s Schneider for provision on 3-ph locomotives, the VCB will be provided and supplied with following as scope of supply for 3-ph locomotives. CLW shall incorporate this in the VCB specification as a scope of supply for 3-ph locomotives for Schneider make single bottle VCBs type 22CB.

i) Copper connections along with jaw contact assembly at incoming & outgoing terminal of VCB to receive earthing blade of earthing switch. These copper connections will have provision of enlarged holes for mounting finger contact for better alignment & additional holes for connection.

ii) Longer arm of earthing blade in one piece for earthing switch.

iii) Insulating cap as per Schneider drawing No.LSC:842, rev. 'A' provided at lower terminal to cater 250 mm earth clearance.

5.0 APPLICATION TO THE CLASS OF LOCOMOTIVES:

All 3-phased electric locomotives (WAP5, WAG9, WAP7)

6.0 MATERIAL REQUIRED:

As indicated at Para 4.6 above. This will be supplied by M/s Schneider for mounting their VCB in 3-ph locomotives as part of the scope of supply of their VCB type 22CB.

7.0 MATERIAL RENDERED SURPLUS:

Nil

8.0 REFERENCE :

i) Railway Board's letter No.2000/Elect.(TRS)/441/12 dt.27.03.2006.

ii) CLW's letter No. ELDD/1501 dt. 15.03.2013.

9.0 MODIFICATION DRAWING:

As per enclosed drawing No. SKEL-4704, sketch at **Annexure-I and M/S Schneider's drawing No.** LSC:842, rev. 'A'

10.0 AGENCY OF IMPLEMENTATON:

All Electric Loco Sheds and POH Workshops/CLW with 3-Ph electric locomotives.

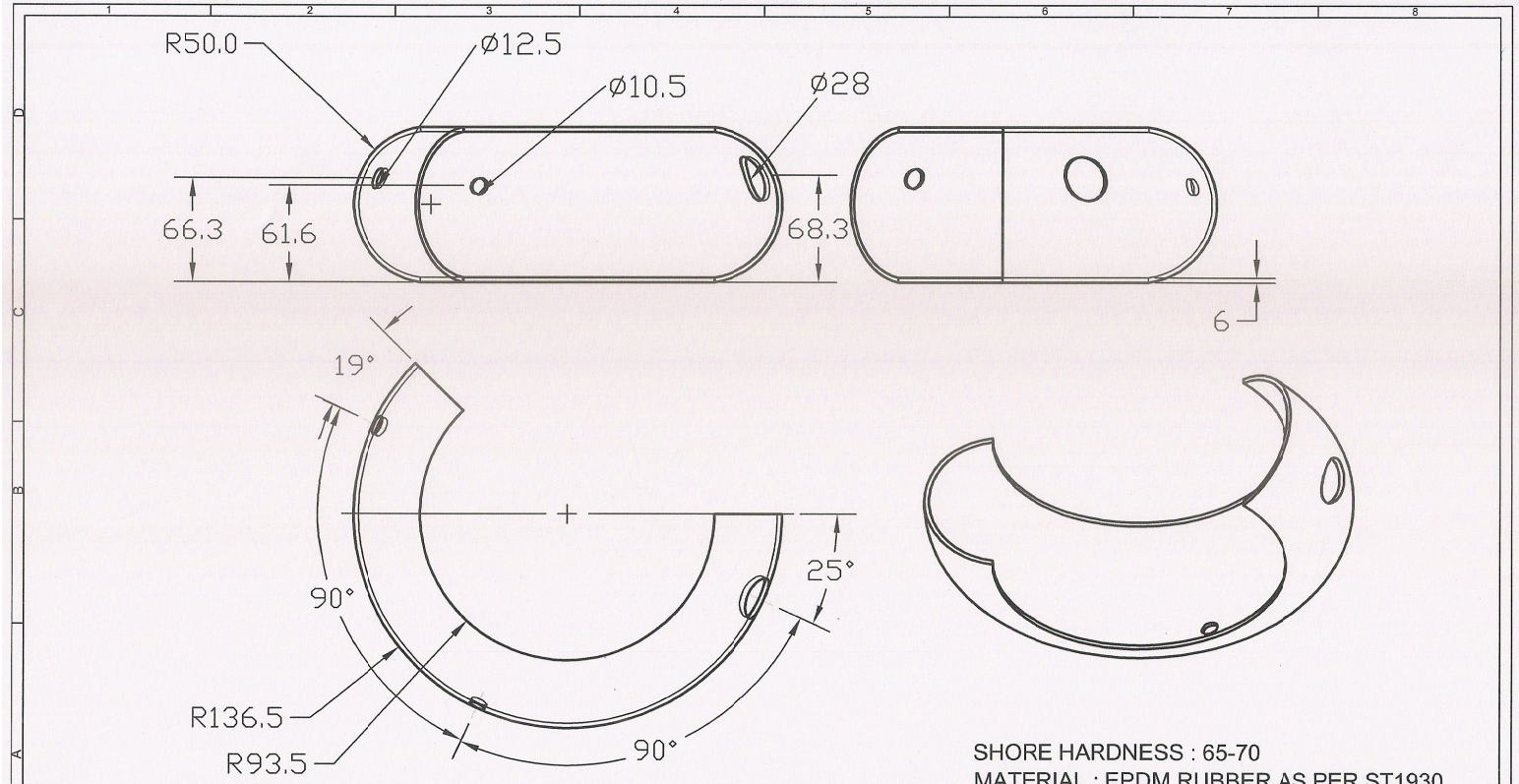
DA: As above.

(A.K.Singhal) 13/1/2014
for Director General (Elect.)

TAP SQUARE BLOCK
ROOF TOP
ROOF CUTOUT DRAWING OF VCB
AND EARTHING SWITCH
ROOF OF LOCOMOTIVE
NOTE:
A : ROOF INSULATOR FOR BUSBAR
B : PIPE
C : SURGE ARRESTOR
D : OIL PIPE FOR COOLING
E : CIRCUIT BREAKER (OF SECHERON DESIGN)
F : EARTH SWITCH
G : CHANNEL WELDED ON BOTH SIDE OF ROOF
I : ROOF LINE INSULATOR
REF.
SCALE:NTS
APPD. BY:-
FOR DG
EXISTING ARRANGEMENT OF 3 PH LOCOMOTIVE
FIRST ISSUED
FOR VCB (OF SECHERON DESIGN)
& EARTH SWITCH (OF SECHERON DESIGN)
SUPERSEDS
RDSO ELECT. DTE. SKEL-4704
SUPERSEDED BY
STATUS
ALT.
REF. NO.
DESCRIPTION
APPD.BY
DATE
3.5.06
ALT
Chief

Annexure - 1

Schneider will provide following items,
1. 1 no long Earth Switch Blade.
2. Copper connections along with Jaw contacts – with elongated holes for Jaw contact mounting for ease in operation of Earth Switch + Additional hole - Each on incoming copper connection & outgoing copper connection.
3. Insulating cap in middle flange – with 3 point fixation - to avoid possible bending during running of locomotive – As suggested by RDSO.
1
2
3
2



SHORE HARDNESS : 65-70
MATERIAL : EPDM RUBBER AS PER ST1930
MATERIAL CODE : NPRM5511310

		CUSTOMER :	ALL DIMENSIONS ARE IN MM UNLESS AND OTHERWISE STATED.	Schneider Electric
		CONSULTANT :		
		P.O. NO. :		
		DATE :		
A	DRAWING MODIFIED AS PER RDSO REQUIREMENT	FLANGE CAP FOR 3 PH ARRANGEMENT	S.O.NO.	TITLE :
REV No	DESCRIPTION		SCALE ——	DRAWN RISHI 09/07/13 · CHECKED RISHI 09/07/13 · APP VKG 09/07/13
	SEIL			DRAWING NO. LSC:842 · SHEET NO. 00 · REV. A