ITEM NO.5 – PROTECTION AGAINST ELECTRIC SHOCK & INTEGRITY OF PROTECTIVE CIRCUITS

PROTECTION AGAINST ELECTRIC SHOCK – In accordance with AS/NZS 61439.1:2016, Clause 10.5.2

Effective continuity between the exposed conductive parts of the ASSEMBLY and the protective circuit. BE Switchcraft, verifies by testing every Switchboard, using resistance measuring instruments during the routine verification test.

SHORT-CIRCUIT WITHSTAND STRENGTH OF THE PROTECTIVE CIRCUIT –

Verification by comparison is achieved at BE Switchcraft when comparing the assembly with an already tested designs utilising items 1 to 7 of the check list in Table 13 shows no deviations (See Table 13, page 2 of this document).

TESTED DESIGNS

Short Circuit Withstand Test	Report No.	Tested by:
Test Item: Incoming & Outgoing Units, 65kA-1 second	50054963 002	TUV Rheinland Australia, High Power Laboratory Heidelberg Vic
Test Item: Main Busbars, 65kA-1 second	50054963 003	TUV Rheinland Australia, High Power Laboratory Heidelberg Vic
Test Item: DPI Busbar systems 63kA-1 second	1119/2	Parkside Laboratories (Aust), Heidelberg West DC, Victoria
Test Item: DPI Busbar systems 50kA-1 second	1119/1	Parkside Laboratories (Aust), Heidelberg West DC, Victoria
Test Item: DPI Busbar systems 35kA-1 second	1119/3	Parkside Laboratories (Aust), Heidelberg West DC, Victoria

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Table 13 - Short-circuit verification by comparison with a reference design: Check list (10.5.3.3, 10.11.3 and 10.11.4)

Item No.	Requirements to be considered	YES	NO
1	Is the short-circuit withstand rating of the ASSEMBLY to be assessed, less than or equal to, that of the reference design?		
2	Is the cross-sectional dimensions of the busbars and connections of each circuit of the ASSEMBLY to be assessed, greater than or equal to, those of the reference design?		
3	Is the centre line spacing of the busbars and connections of each circuit of the ASSEMBLY to be assessed, greater than or equal to, those of the reference design?		
4	Are the busbar supports of each circuit of the ASSEMBLY to be assessed of the same type, shape and material and have, the same or smaller centre line spacing, along the length of the busbar as the reference design? And is the mountiing structure for the busbar supports of the same design and mechanical strength?		
5	Are the material and material properties of the conductors of each circuit of the ASSEMBLY to be assessed the same as those of the reference design?		
6	Does the short-circuit protective devices of each circuit of the ASSEMBLY to be assessed — - have a breaking capacity not less than the short-circuit rating of the assembly at the rated operational voltage of the assembly? - in case of a current limiting protective device: Have a peak let through current and let through energy at the short-circuit rating and the rated operational voltage of the assembly equal to or smaller than the reference design? - in case of a non-current limiting device: Have a rated short-time withstand current (Icw) equal to or higher than the reference design? - fulfil the requirements of co-ordination with upstream and downstream devices (see 9.3.4). - have equal or smaller critical distances (safety perimeter) to the reference design. - maintain identical mechanical orientation, including the direction and position of venting of the arc chutes.		
7	Are the short-circuit protective devices of each circuit of the ASSEMBLY to be assessed equivalent, that is of the same make and series with the same or better limitation characteristics (I^2t, I_{pk}) based on the device manufacturer's data, and with the same arrangement as the reference design? Is the length of unprotected live conductors, in accordance with 8.6.4, of each non-protected circuit of the ASSEMBLY to be assessed less than or equal to those of the reference design? If the ASSEMBLY to be assessed includes an enclosure, did the reference design include an enclosure when verified by test? Are the compartments of each circuit of the ASSEMBLY to be assessed of the same mechanical design and at least the same dimensions as those of the reference design?		

'YES' to all requirements — no further verification required.
'NO' to any one requirement — further verification is required.

a Short-circuit protective devices of the same manufacturer but of a different series, or devices from a different manufacturer, may be considered equivalent and be substituted for the original device the manufacturer are complied with and the assembly manufacturer declares the performance characteristics to be the same or better in all relevant respects to the series used for verification, e.g. breaking capacity, limitation characteristics (I^2t, I_{pk}), and the critical distances (safety perimeters).

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