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Test Recommendations for Ground Screen Power Cable Connections

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Summary

This technical brochure addresses the issue of cable failures originating from improper connection of the metallic screen(s). The failures are often located close to joints and terminations but can also be seen at random positions along the cable route. Large conductor cross-sections are often involved, resulting in large induced currents for solid bonded metallic screens. Failures are reported in the distribution and transmission networks, as well as in power plants and onshore/offshore wind farms. These failures are often associated with very high repair costs, interruption of delivered power and even personnel safety issues. In general, the actual ampacity of the installed metallic ground screen connections is not known or assessed.



Some observed failures are due to incorrect installation of the metallic connection devices. As the cable and accessories are often delivered separately by different manufacturers, the compatibility of different designs is also in question.

Report Elaboration

This first part of the brochure gives an overview of different designs of distribution network cables. The second part includes reported failures with root cause due to local overheating at or near metallic cable screen connections. The final part includes test recommendation for power cable screen connections. The test recommendation includes guidelines for sample number and preparation, and temperature and resistance measurements. To date, no other guidelines, qualification tests or standards exists for the variety of power cable screen connections that are available. The working group is of the opinion that the testing philosophy can be used, or adapted to, equipment in LV, MV, HV and EHV cable systems.



Structure of the final report

The final report include the following main parts:

- i) Cable Screens and Metallic Laminate Design Types for the Distribution Network
- ii) Reported Service Failures due to Thermal Overheating at Screen Connections
- iii) Test Recommendations for Power Cable Screen Connections

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