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Specifications for power cables

From the perspective we have as an independent third party in the market place, we observe an increase in the amount of power cable system projects for both land applications and submarine applications. We also observe that requirements to cable projects are increasing and that cable systems are installed in increasingly complex environments. However, it appears that this increasing amount of projects does not lead to a similarly increasing amount of experts and personnel to handle these projects, leading to less time available for more power cable projects.

As a third party, we are often involved when non-conformities happen in projects or when failures happen. Note that non-conformities happen before the commissioning of a power cable system while after commissioning, failures happen. These failures are not always an electrical breakdown, but can also be e.g. unexpected overheating or an unexpected difficulty of the cable system meeting a requirement. A lot of projects suffer from such non-conformities or failures. It is our experience – after evaluating many of such non-conformities and failures – that about two-third of the non-conformities or failures could have been prevented. However, the issues are not prevented because of a lack of quality management or attention in the respective projects.

Quality management is important to perform projects without (too many) significant non-conformities or failures and is therefore applied to ensure that the realisation process leads to the fulfilment of the project requirements. However, these project requirements are not always clear, because technical specifications or ‘employer requirements’ are unclearly formulated or incomplete.

Unclarities in specifications can lead to the situation that the power cable in the end is not able to meet the project needs, that unclarities exist in the project and in the quality control of that project causing people or companies to not be aligned, that unclarities develop in between the responsibilities of different parties, and that in case of problems, significant discussions and delays result. Our experience is that non-conformities and failures in power cable projects that (partially) arise out of unclear specifications, is leading to much effort being paid by companies and people that are increasingly busy.

Because in the future we expect the amount and pace of power cable projects to increase, we believe there is an increasing need to both decrease the amount of non-conformities and failures, and to decrease the amount of time spend on clarifying and detailing project requirements.
Solutions that can help to meet this need, can be:

1. Standardisation, in which power cable projects also for the HV have an increasingly standardized cable design, system design, and are applied in a standardized environment by using standardized installation procedures. This can lead to interesting gains in speed.
2. Creation of specifications such that these are complete and clear and help to avoid problems in later project phases, that these are taking into account the latest

developments in technology, standards and guidelines and such that they do not consume time to prepare.

Already interesting examples and experiences exist to achieve the solution of standardisation mentioned above. On the second topic, we are currently developing the idea to automatically create specifications via a web-based service for global usage. The automated specifications will lead to a base specification that is clear and complete. A limited amount of project specific information will have to be added for which guidance will be developed. The aim of the idea is to be able to make up-to-date specifications in a very fast way while ensuring their completeness and clarity.

To summarize, on the question raised "*…which are possible areas that need to be enhanced to support the expanding industry for insulated power cables?*", we believe that standardisation of power cable projects, and a quick, clear and complete way of developing specifications deserves attention.