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GROUP REF. : B1
PREF. SUBJECT : PS1
QUESTION N° : Q4

Method of dynamic ampacity calculations

Due to the particularity of offshore wind power projects, it is usually necessary to consider the dynamic calculation of the ampacity. For the dynamic calculation of the ampacity, although there have been some examples (Cigre TB610, Cigre 2018 B1-118) to illustrate how to calculate, there is still no clear criterion to judge whether the designed cable meets the requirements.

Here are some dynamic calculation requirements for different projects for reference:

- Cable conductor temperature modelling with a one-year load profile

Criterion: Whether the conductor temperature after one-year simulation ＜90 °C

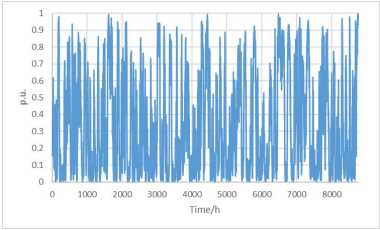

Figure 1 one-year load profile

- Cable conductor temperature modelling with one processed load profile, e.g. Step1: infinite duration @ 45% of max. load, Step2: 40d @ 67% of max. load, Step3: 20d @ 75% of max. load, Step4: 12d @ 90% of max. load, Step5: 8d @ 100% of max. load. (Ref. Cigre TB610)

Criterion: Whether the final conductor temperature＜90 °C

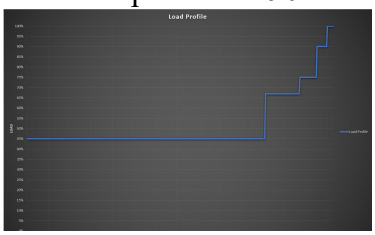

Figure 2 processed load profile

- Cable conductor temperature modelling with a full load current. (Ref. Cigre 2018 B1-118)

Criterion: Whether the time that the conductor temperature reaches 90 °C is longer than 4380 hours (half year equivalent).

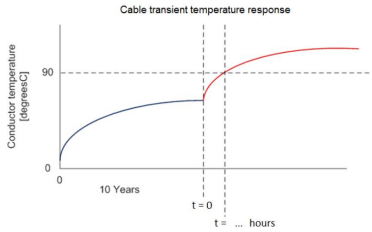

Figure 3 Cable transient temperature response based on two load steps

Q&A

Which are possible areas that need to be enhanced to support the expanding industry for insulated power cables?

To develop or confirm a generally accepted criterion for dynamic ampacity calculation judgment.