

CIGRE Study Committee B1

PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP

WG 1^N B1.72	Name of Convenor: Frank De WILD (Netherlands) E-mail address: frank.dewild@dnvgl.com	
Technical Issues #²: 1 and 2		Strategic Directions #³: 1, 3, 8 and 9
The WG applies to distribution networks⁴: Yes		
Potential Benefit of WG work #⁵: 1, 2, 3 and 4		
Title of the Group: Cable rating verification – application in complex situations		
Scope, deliverables and proposed time schedule of the WG: Background: <p>This WG is a continuation of WG B1.56 about “Cable rating verification” which completed its work.</p> <p>WG B1.56 has covered the base cases as described in the original TOR. SC B1 recognized the value of the case studies that have been considered and proposed to perform some additional case studies relevant to situations that become rather common in cable projects. The WG members volunteered to continue their work on cable rating verifications for a limited time period. This allows for the verification of current rating calculations in more complex situations in a relatively quick pace because of the achieved alignment on how current rating calculations should be performed within the existing working group.</p> <p>It is noted that the original TOR was based on a recommendation of WG B1.35, who produced a guide for rating calculations of insulated cables, TB 640. One of the issues considered in that guide was the use of calculation tools. It was recommended by the WG that the user should verify the calculations of the tool before using it. Despite some tools being used frequently, and by multiple companies, it is generally unclear exactly how a calculation is performed by the calculation tool. Given the many different installation situations and cable designs which exist, and for which a strict IEC based calculation is not even possible (refer to the many examples in the technical brochure of WG B1.35), the user should verify how the situation is treated by the calculation tool. As it is rather difficult to verify calculations of calculation tools, it was proposed to help the cable community by setting up a uniform calculation verification protocol, which can be used to ensure a correctly working software within a certain (limited) domain.</p> <p>This goal was achieved by WG B1.56 for a multitude of different cable systems in a number of different installations, but always for single cable circuits in relatively simple environments so far. Currently it is proposed for this new WG to consider some more complex situations to provide guidance to the cable community on how to perform relevant calculations.</p> <p>Scope:</p> <p>To continue the work of WG B1.56 by providing guidance and a number of case studies to help the user to correctly calculate the current rating in more complex situations. It is proposed to:</p> <ul style="list-style-type: none"> • Consider the following complex situations to calculate the current rating: <ul style="list-style-type: none"> ○ Multiple circuits in parallel (thermal and electrical effects, multiple cables per phase) 		

- Cables close to an external heat source
- Dynamic and cyclic ratings in a single cable system (IEC and Neher McGrath)
- Cables in a horizontal directional drilling (in various configurations, with various fillings: air, water, grout)
- To detail the cases, calculate the current rating and agree on the results
- To deduce guidance on how to perform the calculations
- To report the calculations in full detail in a second Technical Brochure in the same style as the current proposed TB of WG B1.56.
- To update the tutorial of WG B1.35

It is noted that in this work, no verification of tools itself will take place.

Membership:

Appointments will be done by the members of SC B1 keeping in mind this WG is a continuation of WG B1.56.

Duration:

It is proposed to end this WG in 2 years' time. No further extension will be requested.

Deliverables:

- Technical Brochure and Executive Summary in Electra
- Electra Report
- Tutorial (tutorial of WG B1.35 will be updated)⁶
- Webinar⁶

Time Schedule: start: April 2019

Final Report: December 2020

Approval by Technical Council Chairman:

Date: April 5th, 2019



Notes: ¹ Working Group (WG) or Joint WG (JWG), ² See attached Table 1, ³ See attached Table 2, ⁴ Delete as appropriate, ⁵ See attached Table 3, ⁶ Presentation of the work done by the WG

Table 1: Technical Issues for creation of a new WG

1	Active Distribution Networks resulting in bidirectional power and data flows within distribution levels up to higher voltage networks
2	Digitalization of the Electric Power Units (EPU): Real-time data acquisition includes advanced metering, processing large data sets (Big Data), emerging technologies such as Internet of Things (IoT), 3D, virtual and augmented reality, secure and efficient telecommunication network
3	The growth of direct current (DC) and power electronics (PE) at all voltage levels and its impact on power quality, system control, system operation, system security, and standardisation
4	The need for the development and significant installation of energy storage systems, and electric transportation, considering the impact they can have on the power system development, operation and performance
5	New concepts for system operation, control and planning to take account of active customer interactions, and different generation types, and new technology solutions for active and reactive power flow control
6	New concepts for protection to respond to the developing grid and different generation characteristics
7	New concepts in all aspects of power systems to take into account increasing environmental constraints and to address relevant sustainable development goals.
8	New tools for system technical performance assessment, because of new Customer, Generator and Network characteristics
9	Increase of right of way capacity through the use of overhead, underground and submarine infrastructure, and its consequence on the technical performance and reliability of the network
10	An increasing need for keeping Stakeholders and Regulators aware of the technical and commercial consequences and keeping them engaged during the development of their future network

Table 2: Strategic directions of the Technical Council

1	The electrical power system of the future: respond to speed of changes in the industry
2	Making the best use of the existing systems
3	Focus on the environment and sustainability
4	Preparation of material readable for non-technical audience

Table 3: Potential benefit of work

1	Commercial, business, social and economic benefits for industry or the community can be identified as a direct result of this work
2	Existing or future high interest in the work from a wide range of stakeholders
3	Work is likely to contribute to new or revised industry standards or with other long term interest for the Electric Power Industry
4	State-of-the-art or innovative solutions or new technical directions
5	Guide or survey related to existing techniques; or an update on past work or previous Technical Brochures
6	Work likely to contribute to improved safety.
7	Work addressing environmental requirements and sustainable development goals.