

138 kV Cable System Qualification to IEC 60840-2011 / ICEA S-108-720-2012 / AEIC CS-9-06 / IEEE 48-2009 / IEEE 404-2012

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Integration of conformance requirements from multiple standards remains akin to a high wire performance. Users express a preference for the cable system route via IEC / AEIC, whilst recognizing a value in the component approach (ICEA, for cable, and IEEE, for accessories). This presents manufacturers with a considerable challenge. Consequently a route to qualify two cable designs, outdoor terminations, oil filled and dry type GIS terminations, straight joints and cross-bonded joints was developed by G&W and Viakable. The test program was conducted at NEETRAC.

The paper will discuss:

- design of the test loop including the optimal selection of the components (Fig 1),
- sequencing of construction and the required tests,
- selection of the most stringent elements (voltages, number of cycles, temperatures) within the respective standards,
- outcome of the program and
- considerations for technical committees engaged in the development and maintenance of the aforementioned specifications.



Fig 1 Optimized test loop configuration

An important factor in the design of the test loop for the manufacturers was the impact of the currents (Fig 2 to 4) required to satisfy the requirements of the relevant standards.

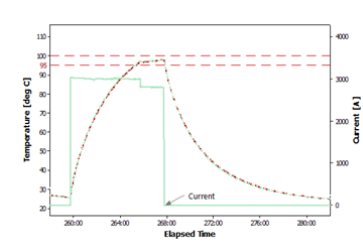


Fig 1 IEC only

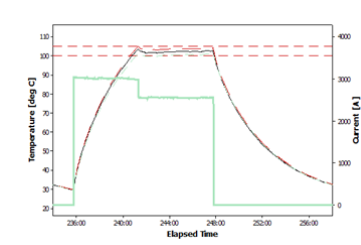


Fig 2 IEEE only

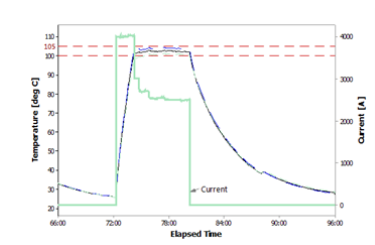


Fig 3 IEC & IEEE simultaneously

The cable system approach of the latest iterations of the AEIC & IEC standards as favored by Utilities is reinforced. Also, practical and critical limitations of IEEE 48 and IEEE 404 requirements that have been extended from the experience with Medium Voltage accessories are identified and discussed. These support current efforts underway to review the structure of these specifications.