

The importance of standardization on transformer components – A case study on challenges posed by non-standardized transformer bushings – Khayakazi Dioka

A significant portion of the Eskom transformer fleet was sourced while the country was under sanctions, resulting in non-standardized units. This not only resulted in transformers being non-standardised, but also transformer components. One of the major components of power transformers are bushings. While the network voltages are standardized across the country, different sizes of bushings of the same voltages are found on transformers all over the network. Transformer bushings are designed with an expected lifespan of between 20 and 30yrs. This means that a bushing is likely to be replaced at least once within a 40-year lifespan of a transformer. Another reason that calls for bushing replacement is the change in technology, OIP to RIP/RIS.

As part of the tendering process for transformers and its components, specification compilation is a critical element. Standardisation was then incorporated into the specification. When replacing the existing bushings with standardized bushings, some challenges were experienced. These included preparing modification instructions upon bushing failure to ensure interchangeability between the existing bushing and the new standard one. The modification instructions included remanufacturing of adaptor flanges, bushing conductors turret modifications. In instances where drawings of existing bushings are not available or unclear, a transformer would be taken out of service for measurements before a modification instruction package can be finalised. There has been experiences where these bushings could not be replaced with the standard sizes, thus requiring a separate procurement for specific sized bushings to match the existing one. In all these scenarios, long outages become the undesirable outcome.