ABSTRACT

Amidst the rising demand for reliable internet connectivity in Indonesia, the quality of infrastructure, such as dropcore cables, emerges as a crucial factor in determining customer experience. In a case study at a leading telecommunications operator, the new G.657A2 3SL dropcore cable is being implemented for all new customer installations, which features three strength members for additional structural protection. This initiative replaces the former standard, the G.657A1 2SL cable, which only had a two-layer reinforcement. A preliminary analysis identified the dropcore segment as a critical point in provider's FTTH network, accounting for 67% of all customer trouble tickets (Q) at the beginning of the observation period. This research analyzes the effectiveness of this transition by comparing the attenuation performance of the two cables and its direct impact on the reduction of trouble tickets. The research methodology integrates three approaches: actual attenuation measurement on the ODP-ONT link using an Optical Power Meter (OPM), Power Link Budget (PLB) simulations, and 30-day signal stability monitoring via the ACSIS dashboard. All technical and operational data were processed and analyzed using a custom-developed tool based on Visual Basic for Applications (VBA) to ensure accuracy and efficiency.

The analysis results demonstrate a significant operational impact, with a 25.2% reduction in dropcore-related trouble tickets. This success is underpinned by the consistently measurable technical advantages of the G.657A2 3SL cable. The average actual attenuation for the 3SL cable was recorded at only 0.80 dB, far superior to the 2SL cable, which reached 2.17 dB over a 50-meter span. In terms of reliability, the 3SL cable demonstrated higher stability, with a potential issue rate of only 14.9% compared to 18.3% for the older cable. The G.657A2 3SL cable consistently demonstrated its ability to maintain signal stability against normal operational degradation. However, findings show that this superior resilience has its limits in situations involving extreme post-installation physical damage. Furthermore, the research reveals that network architecture factors, particularly the use of high-ratio splitters, have a more dominant contribution to attenuation than the length of the drop cable itself.

Keywords: *Drop Core Cable, Attenuation, G.657, Power Link Budget, Customer Trouble Ticket, VBA*