techfront

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FAILURE ANALYSIS IN CABLE JOINTS

The newer generation of cable jointing systems are more "Science" than "Art and are amenable to better understanding by Engineers. When they fail, the remains leave much information that can be used to reduce the incidence of failures in the future.

POSSIBLE REASONS FOR FAILURE

Poor Stress Control- incorrectly applied, or improper functioning.
Poor insulation - due to poor material properties, or inadequate thickness.
Poor sealing- leading to water ingress.
Poor electrical connections- improperly tightened or crimped, leading to overheating under load, or burn out under short-circuit
Poor design, which while successful in the lab, does not adequately cater to real world conditions.
Poor material supply - perhaps not in conformity with that used for qualifying the accessory
Poor jointing technique - requiring upgradation of jointer skills.

Study of failed Cable joints can provide very useful information and reduceng future failures by timely corrective action.

CHECK LIST

1. Record the type of failed joint and the cable it was installed on for Brand, Type, Voltage and size. A brief description of the site and lay of the cable accessory is useful.
2. Identify the possible point or points of failure within the joint such as Screen end, near the lug, or over the ferrule, or at the earth point.
3. Check the correctness of installation dimensions with reference to the manufacturer's Installation Instruction sheet.
4. Check the correctness of placement of components. First check the externally visible components. In case of PILC cables pay special attention to sealing at all possible joints which could allow moisture to reach the paper insulation.
5. Then sequentially strip the layers, and check the inner layers. Particular attention should be paid to stress control in XLPE cables- is it of the correct length and correctly installed.
6. Check the correctness of connections to the earth of armour and screen, and also of the conductor. Specially check to evaluate the quality of Cripmping in straight joints.
7. Determine the care taken by the jointer by examining workmanship in relation to cleanliness of semicon stripping without nicking the in lation, and smoothening of insulation by abrasive tape.
8. Examine to see if sealing and void filling materials such as adhesive strip, Stress control mastic, and semicon paint have been correctly applied.
9. Study the healthy or unaffected cores of the joint for indication of the possible reason of the failed core.

In some instances, immediate corrective action is evident. In other cases the best course of action will only become obvious after collecting data on many failures.