Abstract Submitted
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Friction Stir Welded Electrical Splice Joint JOSHUA KELLAMS, PETER MCINTYRE, Texas AM University — Electrical power is distributed from power plants primarily using 3-phase overhead lines. Each overhead head line is typically a bare aluminum cable or a cable of cables. The cable has a maximum continuous length of ˜3.6 km that can be supplied on spools, so that long distance transmission lines require splicing. Currently crimp splices using a sleeve around the butt jointed cables are used. This crimp provides strength against pull out and conduction from wire-to-wire and wire-to-sleeve, but all current must flow through the layers of oxide that are present on all aluminum surfaces prior to crimping. The degradation of aluminum cable is dependent upon temperature, causing the more resistive splice to become the most likely point of cable failure. The use of friction stir welding (FSW) on the splice joint can provide a metallurgical bond between the wires and the wires and sleeve so that current will never be forced to flow through an oxide layer, therefore reducing the resistance of the splice. Progress on the development of using FSW for electrical splice joints will be presented.

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