

## Disruptive Failures of 3M Trifurcating 33kV Joints

A spate of faults on the 33kV cable network have in the main been associated with the failure of a specific type of Trifurcating joint which was used during the period between 2002 and 2010. The joint is known as a 3M cold shrink 'Trif' joint.

Following isolation of a faulted 33kV cable circuit, excavation works commenced at the fault location. Whilst excavating, an adjacent 33kV cable was exposed along with a 3M Trif joint near to the faulted circuit. In this instance the trifurcating joint discovered was not evident on the UMV plans, however an immediate decision was taken by the Field Engineer and Control Engineer to clear the excavation area and switch out this adjacent 33kV circuit. This decision was based on their experience of this type of joint and as part of their risk assessment the adjacent cable circuit was isolated so that work could continue safely on progressing the fault repair.

Following repairs and sanding of the whole excavation, the faulted circuit was returned to service. Shortly afterwards the adjacent 33kV circuit was also re-energised to secure the system. Approximately 18 hours later the 3M 33kV trifurcating joint disruptively failed.

A similar event has since occurred on a separate 33kV fault location when a 3M Trif joint was discovered on an adjacent cable circuit. Upon discovery, works were ceased by the excavation team and the work area cleared. The site team contacted the Field Engineer to report the Trif joint discovery and shortly afterwards the Trif joint disruptively failed.

The actions of staff in both incidents are commended in terms of their risk assessment and prompt action to withdraw staff from the work areas.

### Recommendations:

- Operational teams and excavation contractors involved with working on or adjacent to 33kV cables should make their teams aware of the details contained in this safety express and thoroughly examine UMV plans for joints of this type prior to excavating.
- Should plans indicate evidence of this type of Trif joint, then the risk assessment should be reviewed and appropriate action taken. This may include switching out the circuit or altering the network arrangements to mitigate risk. Similarly, if this type of joint is discovered during works, then work should be suspended, the area cleared until appropriate actions are agreed with the Field Engineer and Network Management Centre.

