Polymeric Pin Insulator Failure

On 4th June 2019, in the Wirral District in SP Manweb, following a patrol of an HV overhead line fault, a reclose of the circuit resulted in a conductor dropping to the ground. Subsequently, a faulty 11kV polymeric pin insulator was found on the pole where the conductor failed (see fig.1).

On Friday 14th June 2019 a second failed 11kV polymeric pin insulator was discovered during a post refurbishment audit by the OHL service partner. This line had been energised on Monday 10th June 2019. This line had not tripped, the insulator was sitting on the steelwork, and the pole top was burnt (see fig.2).

On Thursday 20th June a third 11kV polymeric pin insulator failed in the Cheshire District. This line had been refurbished approximately two weeks previously.

All failed insulators have been recovered, along with the two adjacent insulators from the 14th & 20th June faults, and a forensic investigation initiated by Engineering Design & Standards.

Initial investigations have identified what appear to be teeth marks from a Stilson wrench, or similar tool (see fig.3).

Whilst it has not been established if this is a factor in the failures, this serves as a reminder that pin insulators should be hand tightened only, as per trained procedures.

There are currently two Approved suppliers / manufacturers of these insulators, Allied Insulators (Cangzhou Hualing) and Henley (Hendrix). Initial investigations have determined the three failed insulators were of the type supplied by Allied.

Approximately 22,500 Allied polymeric pin insulators have been purchased by SPEN within the last 12 months.

Fig.1 – 1st failed pin insulator

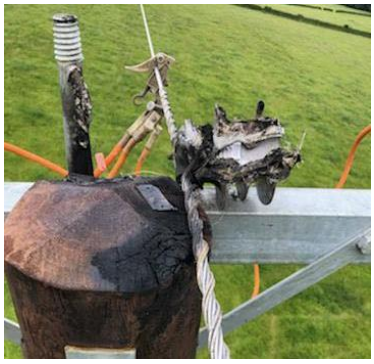

Fig.2 – 2nd failed pin insulator

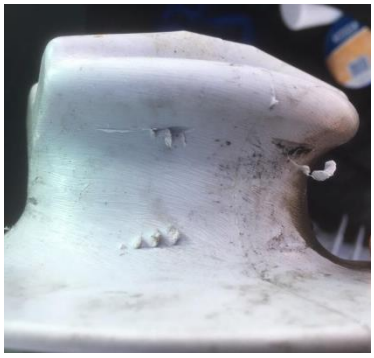

Fig.3 – Marks on failed insulator

Recommendations and action points

- Communicate to all lines staff and contractors that the use of a Stilson, or other tools, to tighten an insulator is NOT a recommended procedure and should cease immediately.
- Ensure Service Partners are carrying out appropriate audits following work.
- As a general reminder, when energising any apparatus following work (or during fault switching), ensure that, where practicable, all staff, contractors and public are clear of the apparatus. (OPSAF-12-004, Section 10.2.21).
- A detailed forensic investigation into the failure of these insulators has been initiated by Engineering Design & Standards. Further updates will be given following the investigation.