

WILTON SITE - SAFETY LEARNING EVENT

Title: Lightning Strike on TPEP

Date of event: 4 August 2012

Details of the Incident

On Saturday 4th August, the Transformer Rectifier (TR) near Gargrave tripped. The TR was reset by a Pipeline Superintendent on Monday 6th. On Tuesday 7th the landowner at Horton Pasture rang the Pipeline Office to report a ground disturbance adjacent to a pipeline marker. A Superintendent attended the scene to assess the situation. The ground at the marker post had been blown out and the marker post damaged. A CP post upstream had also been damaged. Horton Pasture is around 2km downstream of the TR position. The control room were asked to reduce the line pressure as a precaution until further investigation took place.



What had happened

It is thought that a lightning strike hit the CP post, causing the damage seen. The charge from the strike travelled down the CP cable on to the pipeline, travelling upstream to the TR, where the charge exited the line to via the TR cable, causing the TR to trip. The charge also travelled downstream where it found a weakness in the coal tar wrap, at which point it discharged to earth via the wrap.



Our work is never so urgent nor important that we cannot take the time to do it safely

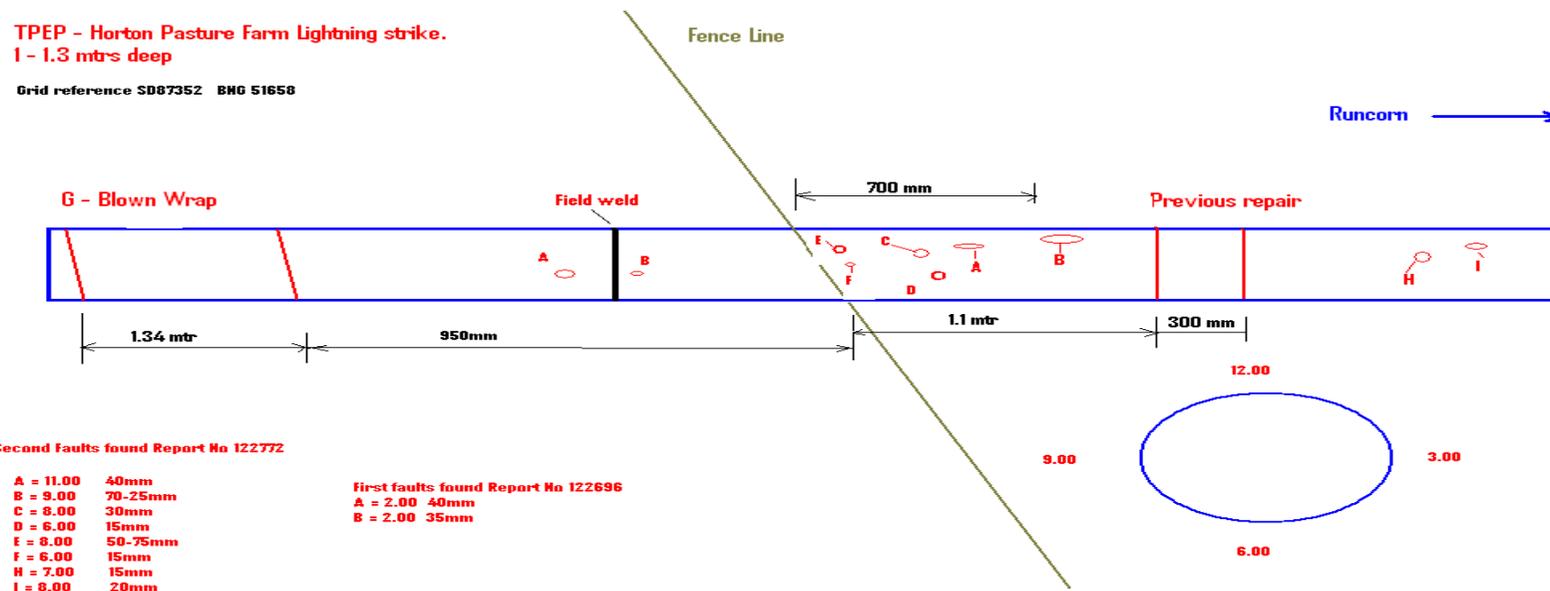
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Investigation

The pipeline was excavated in the location of the ground disturbance. Initially two small wrap defects were found, but on extension of the excavation a larger section of damaged wrap was uncovered. The areas where wrap had been damaged were NDTd using UT thickness measurements and MPI crack detection. There was no visual damage to the pipeline and nothing untoward was shown up on the NDT. The line was re-wrapped and the excavation back-filled.

TPEP - Horton Pasture Farm Lightning strike.
I - 1.3 mtrs deep

Grid reference S087352 BNG 51658



Second Faults found Report No 122772

A = 11.00 40mm
B = 9.00 70-25mm
C = 8.00 30mm
D = 6.00 15mm
E = 8.00 50-75mm
F = 8.00 15mm
H = 7.00 15mm
I = 8.00 20mm

First faults found Report No 122696

A = 2.00 40mm
B = 2.00 35mm

A DCVG survey was carried out up and downstream of the affected area to identify any further wrap defects. The largest reading was 16%IR at a location adjacent to the damaged CP post. This area was subsequently excavated with no wrap defects identified.

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Learning

The area around Horton Pasture is susceptible to lightning strikes due to its location and geography.

Although not large relative to fences, tress etc. pipeline furniture can be subject to lightning strike.

BS EN 62305 indicates that copper cables of 50mm² area are capable of transferring the charge from a lightning strike with no issues. CP cables of 8mm diameter or greater should not be damaged by such a strike. The pipeline wall thickness (in this case) is also large enough to transfer the charge unaffected.

Once on the pipeline, the charge will seek to go to earth via another cable connected to the pipeline or via a weak point in the pipeline wrap.

Non-destructive testing of the areas of damaged wrap is recommended in order to ascertain whether or not any material damage has taken place. This could include thickness checks, crack detection and non-destructive hardness testing.

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