

## SPIKING OF HV CABLES – Update

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| <b>Issue date</b>    | 6 <sup>th</sup> June 2019                |
| <b>Issued by</b>     | Steve Lockett, System Operations Manager |
| <b>Applicable to</b> | All Operational personnel                |

During work to loop in a new HV substation, a live 6.6kV cable was spiked in error causing an explosion and the subsequent injury to a jointer requiring treatment in hospital.



To identify the cable prior to proving it dead by spiking, the Senior Authorised Person (SAP) used the Visual Tracing procedure from CP606 (i.e. cable identified by progressive visual tracing along its length from a point where it is connected to earth to the point of work).

Owing to the substation's concrete ring beam, the HV cable was not sufficiently exposed to enable its identification by visual trace. Through moving of the cable manually from inside the joint hole, a noticeable movement was observed on a cable entering the earthed cable box. The SAP believed the correct cable had been identified. However, this proved not to be the case. The manual manipulation of an unexposed cable as means of identification is unreliable and is not an approved method of identification. Believing he had identified the correct cable, the SAP marked the exposed cable in the joint hole and requested the spiking gun be attached by a jointer.

The SAP obtained permission to spike the cable, but failed to distance himself safely away from the spike position and instead placed himself inside the substation within 2m of the spike position and with limited vision of the surrounding area. In addition, a second jointer was also stood inside the substation to the front right of the switchgear and out of sight of the SAP. Thinking everything was OK, the SAP indicated to the first jointer to pull the lanyard and spike the cable.

Upon spiking the live cable there was a large explosion which immediately filled both the joint hole and substation with flames, arc products and smoke. The second jointer, positioned just inside the substation threshold, was engulfed by the explosion, receiving flash burns to his lower arm and head. The SAP escaped injury by shielding behind the switchgear.



We have decided to share these pictures of the injured jointer's coveralls. The dusky orange patches around the legs, stomach, torso and arms are the scorch marks left from the flash. Had this incident occurred prior to introduction of the arc-resistance coverall, the injuries would have been life changing or worse. This is a stark reminder that when primary risk controls fail, PPE is the last form of defence and why it is mandatory to wear it. During use, the arc resistant coverall shall be worn correctly, with both sleeves covering the arms down to the wrist and fully fastened at the front to the neck.



**Key Points to Remember:**

| Safety Procedure  | Reference                                  |
|---|--|
| A SAP shall ensure all HV cables to be worked on are correctly identified and proven dead.  | DSR 5.9.2 and CP606 B02 - 1.2/3.0          |
| An approved spiking procedure shall be used to identify the cable and prove it dead.  | CP 606 B02 - 1.2/1.3                       |
| If the visual tracing method of identification is used, the cable shall be traced along its entire length from a point where it is connected to earth to the point of work.   | CP606 B02 - 2.3.1                          |
| Where the visual tracing method is restricted, the cable can be identified by placing a ring of suitable material around the cable from a point where it is connected to earth and passing it along the cable to the point of work. | CP606 B02 - 2.4.1                          |
| For Injected Signal and Elimination of All Other Cables Spiking Procedures, then at the point of work, all cables shall be exposed for identification.  | CP606 B02 - 2.1.3 / 2.2.2                  |
| Before the cable is spiked, a SAP shall ensure that the lanyard is extended to at least 7 metres and all personnel and members of the public are at a safe distance.  | CP606 B12 - 2.1.3                          |
| A SAP shall control the lanyard operation and spiking procedure.  | CP606 B12 - 2.9                            |
| PPE identified for the task shall be worn at all times.   | As per Standards for PPE and relevant CP's |