Safety Alert: HS003/17

Safety Alert to IWEA member

Ejection of debris during HV fuse inspection

Whilst checking HV fuses under a Permit to Work (PTW) within a wind turbine package switch-fuse unit, fuse debris was ejected from a fuse chamber towards the operative causing minor burns on the neck and wrists above the gloves.

What can we learn from this incident?

This is the first time we have experienced debris being ejected from a switch-fuse panel and this incident is currently under investigation. Should you discover a fuse that has blown but failed to operate the trip mechanism, then before removing a fuse cap you should:

1. Allow sufficient time after the isolations are applied to allow any stored heat to dissipate.
2. The operator shall ensure there is no gap in PPE between their gloves and sleeve, and a full-face visor shall be worn.

Background

WTG shutdown on a grid fault, the following morning site
operative attended the turbine to investigate. Analysis of the turbine controller showed the fault to be a voltage drop on 2 phases.

- Site operative attended the HV switchgear, it was found in the normal operating position (the Switch fuse mechanism had not tripped)
- Site operative contacted member of Electrical Engineering Team to discuss and agree a way forward. Engineering agreed to dial into the site ION meter, whilst the site operative checked the HV fuses.
- Site Operative isolated, earthed and issued a PTW for fuse inspection / replacement. Operative also de-energised the HV feeder as an additional precaution.
- Once the PTW as issued the site operative began the process of checking the HV fuses. Once the fuse compartment cover was opened he noticed that one of the fuse striker mechanisms had partially operated, but not tripped the switch.
- When he removed the fuse cap, the switchgear lost its SF6 gas pressure and ejected fuse debris (sand / porcelain particles) towards the operator causing minor burn on the operative's neck and wrists above his gloves.
- Operative attended the doctor and was prescribed cream and antibiotics.
- **Correct use of appropriate PPE saved the operative from more severe injury.**

The root cause is currently under investigation. However, it is suspected that the cause of the debris being ejected is most likely due to the blown HV fuse failing to operate the trip mechanism. This resulted in the blown fuse being heated as it sat for several hours with volts across it. This in turn heated the fuse chamber
and, combined with the resultant SF6 leak into the fuse chamber, created a positive pressure behind the fuse cap.