

UKOPA SAFETY ALERT

HSEQS FEEDBACK NOTICE Return of Experience

Potential for electrocution – Pipeline Transformer Rectifier

1. Circumstances:

- On 13th November 2009, following a maintenance requirement, there was a need to inspect a transformer rectifier that had not been in use for some time. After opening the cabinet, the contractor pushed the cabinet door open with the back of his hand and in so doing, experienced an electric shock, which he described as a tingle.

• **Background information:**

- The pipeline is protected against corrosion via a Cathodic Protection system, which relies on a small DC (Direct Current) voltage being applied to the pipeline via a number of transformer rectifiers spaced along the length of the line. The transformer rectifiers are fed from overhead mains power transformed to 240 volts at the location and then transformed down to 24 volts within the cabinet, the only mains voltage at the cabinet is a fused connection that is transformed down to 24 volts.
- In 2007, EDF Energy had carried out modifications as part of a Motorway widening project. During the reconnection of the low voltage single phase service connection to the overhead line, the neutral and live phase were reversed by EDF Energy. It appears that this situation remained until it was identified by a CP contractor in November 2009. The electrical connection used is called PME (Protective Multiple Earthing). This is where the earth connection for the system is derived from the incoming neutral from EDF. The metal cabinet containing the system is bonded to earth. If the neutral connection is mis-connected to a live



- conductor, the outer metal cabinet will become live.
- It should be noted that there was a real and potential danger that either technicians or members of the public could have come into contact with the faulty equipment. The equipment is within a fenced field, and is a good distance from casual public access. However, there was a potential for electrocution as the metal box was in fact live.

2. Causes:

- **Immediate causes:**

- Failure to identify hazard/risk – EDF crossed polarity.
- Failure to check/monitor – Lack of EDF checks on completed works following work carried out in 2007
- Failure to check/monitor – Pipeline Operator failure to carry out maintenance inspections as recommended in 2002/2003

- **Root causes:**

- PERSONAL FACTORS
 - Lack of situational awareness from EDF contractors (*part of EDF action plan*)
- JOB FACTORS
 - Inadequate development of standards for – EDF contractor procedures (*part of EDF action plan*) and Pipeline Operator maintenance/ inspections (*now in place*)

3. Lessons and recommendations:

- Review reports, produced following internal or external inspection, for relevant maintenance recommendations.
- Consider replacement of cabinets with plastic cabinets on any change of cabinet.
- Ensure contact details are clearly displayed for any remote installations to allow contact to be made before any work (including inspection) is carried out on such installations.